The Iron Age

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A Review of the Hardware, Iron and Metal Trades.

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Draining Machinery in Northern Italy.

The Valley of the Po, the most extensively and most admirably irrigated district in the world, is not less remarkable for the importance and the excellence of the drainage works executed in recent years. In less than 30 years, from 1850 to 1879, upward of 600,000 acres of marshy land in the provinces of Venetia and Emilia alone have been drained and transformed into rich country. The question of drainage has from all time occupied the attention of the population of these Adriatic districts; but, in consequence of the difficulty and more often the impossibility of drainage by natural flow, it is only since the advent of steam that the work of drainage has been thoroughly performed. Drainage by machinery in the Valley of the Po is almost entirely carried out on one uniform plan. The ground to be drained is fenced round by catch-water trenches or canals. Occasionally, when necessary to prevent infiltration, the bottom of the canal is deeply trenched and filled with clay. Within the circumscribed territory a system of drains is cut, in which the water is conducted to the lowest level at a point conveniently selected, where the elevator is erected. By the elevator the water is lifted into a canal or a river, in which it is carried off by gravitation. The elevators have to deal with variable volumes of water at variable hights; but in general the greater the hight the less the quantity to be lifted, so that the work to be done is in some sort constant. The hights vary generally in the ratio of 1 to 3.

Three systems of machines exclusively are employed as elevators: Centrifugal pumps, turbines (*rouets*) and lifting-wheels (*rouets elevatoires*). All of these machines are moved by steam-power, and they are the most economical. Piston pumps employed to raise large quantities of water through small hights have shown not more than 35 per cent. of efficiency. The turbine is only a centrifugal pump on a vertical axis, of which the pipes are replaced by the sides of a well. It consists essentially of a circular crown plate on a vertical shaft,, on the under side of which the blades of a centrifugal pump are fixed. In some instances the blades, instead of being free at their lower parts, are fixed to a circular plate having a central opening equal to that left by the crown plate. The wheel is placed low enough to be submerged at all levels of the water. It is driven by toothed gearing or by bands. The difference between the turbine (*rouet*) and the centrifugal pump is that the passages for water are much larger in the first than in the second. Consequently the velocity of the water is less and occasions less friction, while the water escapes more freely. For small quantities of water the pumps are more economical than the turbines, as the cost of construction of wells is saved. The turbines adapt themselves to great variation of level, while maintaining a high ratio of efficiency—about 75 per cent. Speed is, according to one system, altered by means of changes of toothed-wheel gearing to suit the various levels.

According to another system the speed is maintained constant for different levels, but the efficiency may fall as low as 60 per cent. For this reason in the Po Valley centrifugal pumps and turbines are being gradually replaced by lifting-wheels. These wheels are arranged like undershot water-wheels, but with the reverse action that the water is raised by the wheel. Originally the blades or floats were straight and radial, and the wheels were of low efficiency—about 30 per cent. They dashed the water about as each blade entered it; whence their Italian name of *ruote a schiaffo* (literally, slapping wheels). The blades are now inclined at about 60° to the radius, and are formed with a double curvature, so that the water is lifted without agitation or useless elevation, and by means of a sliding iron shutter the opening for access of water to the wheel is formed at the lower part only. The efficiency is increased as the difference of levels is increased, and it averages 80 per cent.

Since the county clerk's office in this city became a salaried office on January 1 last the receipts have been at the rate of $132,000 a year. Deducting expenses the city will realize at least $70,000 instead of nothing, as formerly. The receipts of the register's office are supposed to range between $90,000 and $130,000 a year.

The Edgar Thomson Rail Mill.

Among the modern American rail mills that of the Edgar Thomson Steel Works, at Braddocks, near Pittsburgh, occupies a conspicuous place. Its particular features, the result of the joint labors of Mr. R. W. Hunt, of Troy, and Mr. R. Jones, of Pittsburgh, are well brought out by the accompanying engravings, taken from the specifications of the patent granted to the latter on April 27, 1886. The three-high train consists of three sets of rolls. A, B and C, shown in the plan, Fig. 1. The weighing rolls A are provided with rising and falling feed-tables, D and E, one at the front and the other at the rear side of the train. One of the series of geared roller-shafts is provided with a friction-wheel, F, which engages with similar friction-wheels on the power shaft G. In the case of the table D they come into contact when the table is depressed, while in the rear table E they are driven when it is raised. This is clearly shown in Fig. 2, which represents a section through the line I, II, in the plan, Fig. 1. Feed table D is in the position in which its rollers are driven, while for E dotted lines show how the table is in its raised position when delivering the bloom to the rolls. The raising and lowering of the two tables is effected by a hydraulic cylinder, through the medium of cranks and pitman, H, Fig. 2. The tables are guided in their vertical movements by sleeves I, sliding on guide-rods attached to the housings. Journaled in the housing at the delivery side of the upper and lower passes are delivery rollers, J, one at each level, driven by belts from the power-shafts at each side of the train. It is apparent from the foregoing description that the rollers of the table D are driven by power when the table is down and acting as a feed table, and that when it is up and acting as a receiving table the rollers are turned, if at all, only by the friction of the bloom as it comes from the rolls. The rollers of the table E, on the other hand, are driven by power only when such table is up and in position to feed the bloom to the upper passes, and when the table is down in a position to receive the bloom from the lower passes, as shown in Fig. 2, the rollers are turned by the friction of the bloom alone. The driven rollers J insure the proper delivery of the bloom from the rolls to the table, and obviate all danger of its stopping so near the rolls or guides as to interfere with its proper transfer by the tables from one pass to another. Secured to the floor in front of the rolls A and projecting up between the rolls of the table D are two rows of inclined guides, K and E, Fig. 3, the purpose of which is to shift the bloom from one of the upper passes over to the next lower pass to the right (or left, as the case may be) and to turn it while being shifted.

By reference to Fig. 3 it will be noticed that the surface of the rollers, when the table D is in its upper position, is above the upper ends of the guides K E. The bloom having gone through pass *a* and returned through pass *b* to the table D, the latter is caused to fall. As it does so the bloom encounters the inclined upper sides of the guides K, and is shifted thereby over on the table, until when the latter reaches its lower position it lies in front of the pass *c*. At the same time the bloom is tipped by the inclines and turns over as it descends to place. When the table D reaches its lower position the friction-wheels F encounter the friction-wheels on the power-shaft below it, and are set in motion, starting the rollers, which drive the bloom into the pass *c*. The operation of the guides E is the same, turning the bloom between the passes *f* and *g*. The rolls B are provided with stationary feed tables M and N, Fig. 1, consisting of suitable frames in which are journaled driven feed rollers having intermediate platforms, O. The rollers of the table M are driven toward the rolls B by the shaft running parallel to the table, connected therewith by bevel gearing. This shaft is driven by a second shaft, Q, through the medium of friction gear wheels. This in turn is driven by the power-shaft G through the medium of bevel gearing. The rollers of the table N are driven toward the rolls B by a shaft connected therewith by bevel gearing. It receives power from the shaft of one of the rollers (in this case the outer one), which is connected by gearing with and is driven by a shaft, P. The other end of the shaft P is connected with the sliding bearings. The purpose of this construction is to disconnect the feed rollers of the table M whenever it is desired to prevent the bloom thereon from being driven into the pass, as is occasionally the case. The middle friction-wheel is thrown into gear with either of the wheels at pleasure by means of a lever connected with the sliding bearings by a system of rods and levers, shown in the upper right-hand corner of Fig. 1, for the purpose of causing the feed rollers of the table N to be driven in either direction, as may be desired.

Extending along the inner side of the feed table D is a rock-shaft, R, Figs. 1 and 3, which is provided with two or more radial arms or levers, and hinged at or to the adjacent side of the frame of the table M are a like number of slideways or bars, S, Fig. 3, which near their outer ends rest on the levers. The inner ends of the bars S terminate between or at the side of the rollers of the table D, and the upper or outer ends, which are beveled to receive the bloom as it comes from the last pass *h* of the roughing rolls A, terminate between the rollers of the table D when the latter is in a raised position On the floor under the rock-shaft R is another rock-shaft, T, which is provided on one side with an arm or lever which bears against a friction roller on the under side of the frame of the table, D, and projecting from the other side of the rock-shaft T is a counterweighted arm, U, which holds the arm in contact with the friction roller as the table D rises and falls. The arm is pivotally connected with an arm which projects from the lower side of the rock-shaft R by a link.

The operation of this construction is illustrated in Fig. 3, and is as follows: When the table D is in a raised position the beveled end of the bars S lie between the rollers in front of the pass *h*, as shown by dotted lines, so that the bloom from the latter shall lie on the table directly above them. Then, when the table D falls, it depresses the cam, which by means of a link and arm turns the rock-shaft R, causing the lever to raise the slideways S. The latter raises the bloom up off the table D, when its gravity will cause it to slide down the ways S to the table M, where it is stopped by the stop B in front of the first pass *i* of the rolls V. The bloom when it leaves the pass *h* is of T-form, and it slides down the ways S, stem foremost, so that when its stem encounters the

(*Concluded on page 17.*)

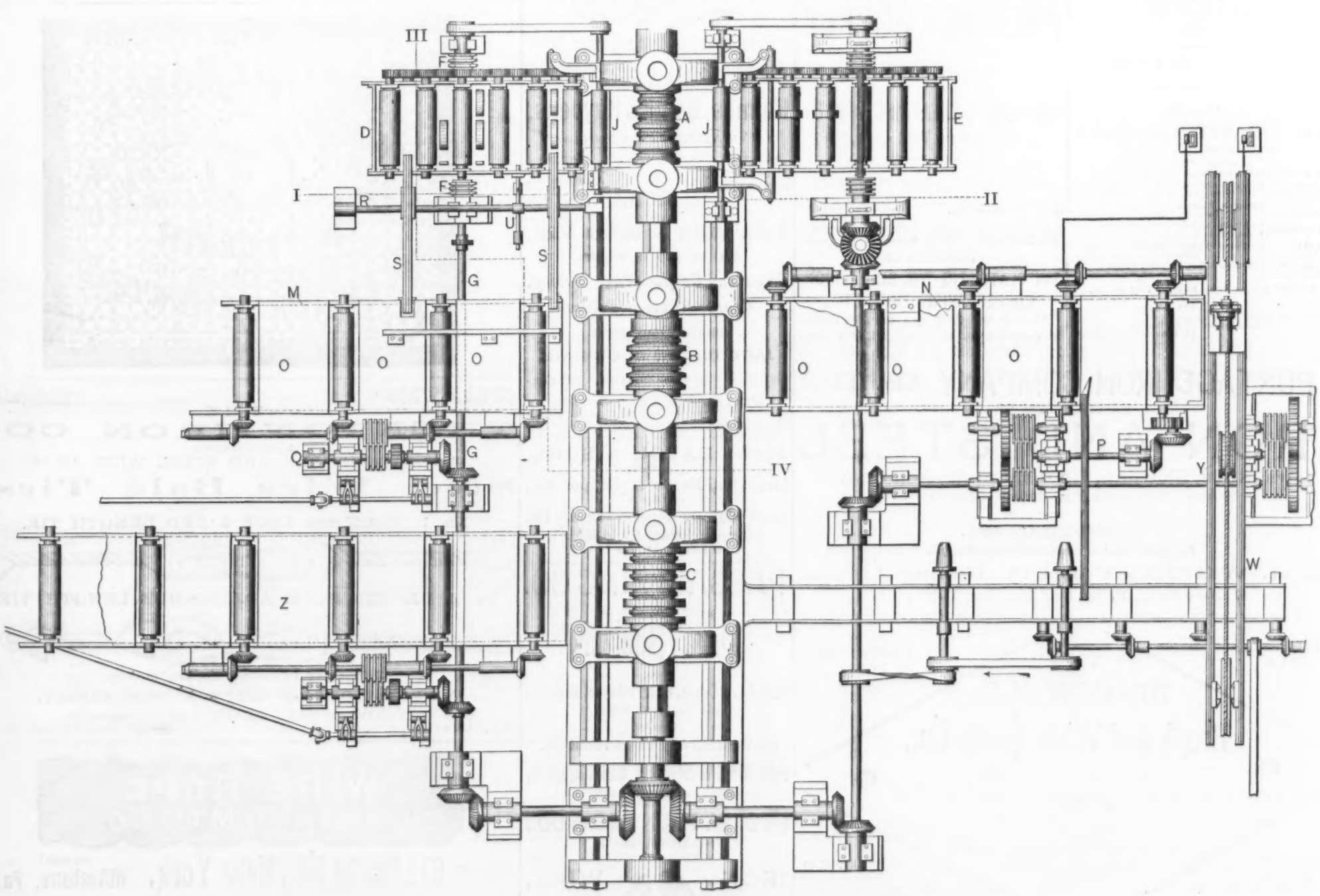

Fig. 1.—Plan Showing Construction.

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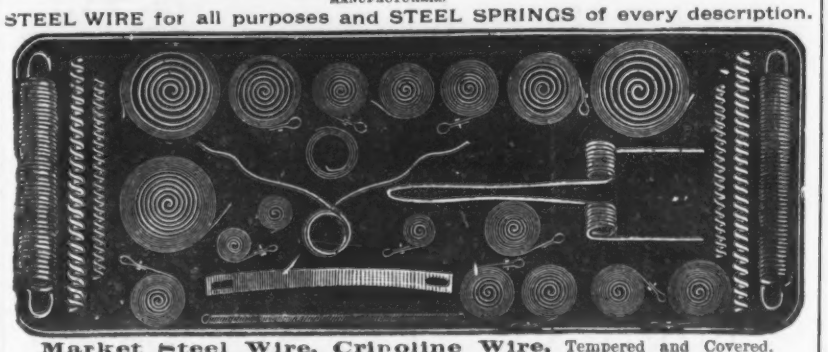

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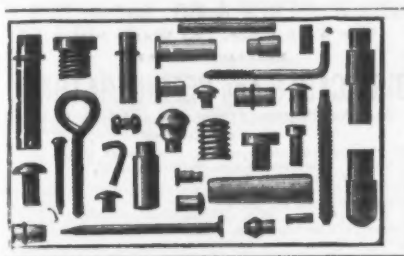

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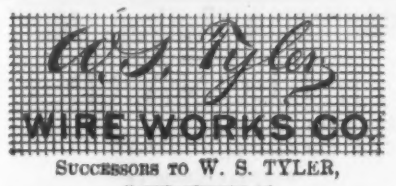

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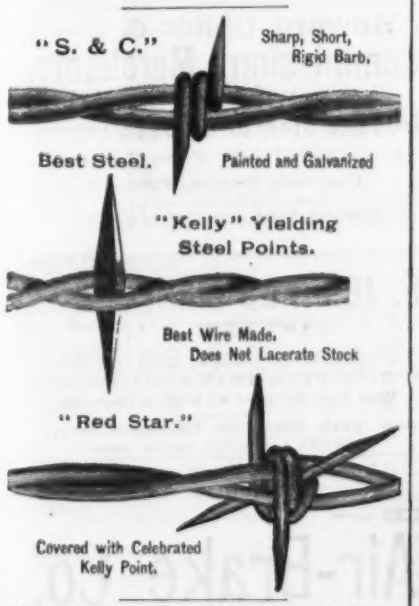

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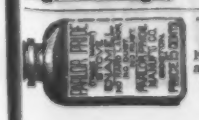

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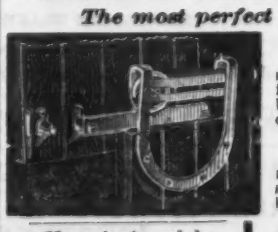

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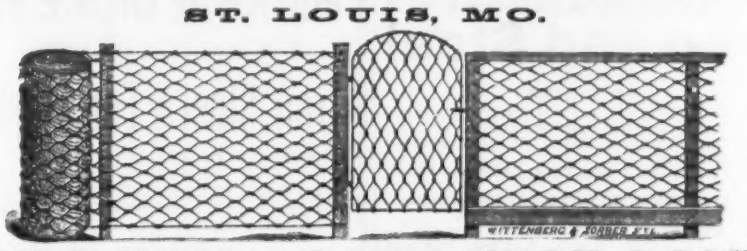

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CHATTEL MORTGAGE—POWER TO MAKE ONE.

The Woodard Mfg. Co. was indebted to the Muskegon Iron Works in the sum of $1200, and its president and secretary and treasurer gave the iron works a chattel mortgage of all its property to secure the payment of this debt, and the sum of $500 more, as it was constantly getting goods from the iron works. The latter assigned this mortgage to the Eureka Iron Works as collateral security for the payment of a debt. The manufacturing company failed, and B., a creditor, on recovering a judgment against it, seized its property in execution. In an action—Eureka Iron Works *vs.* Bresnahan—brought to determine the validity of the mortgage, it was declared to be invalid, and the plaintiff carried the judgment to the Supreme Court of Michigan, where it was reversed. Judge Sherwood, in the opinion, said: "1. There is no question that the manufacturing company could give this mortgage. A majority of the Board of Directors may bind a corporation when duly assembled. Corporations may transact all such matters as, being auxiliary to its primary business, are transacted by ordinary individuals under similar circumstances. They are bound also by the same implications and inferences as natural persons; and a corporation, having the right to create a debt, has the necessary power to give security for its payment in any form not prohibited by law. 2. In the absence of any provision to the contrary contained in the charter of the company, it will be presumed that its president, secretary and treasurer have the authority to make all necessary contracts in transacting the ordinary business of the corporation, within the legitimate scope, object and purpose of its organization. The mortgage in this case is clearly within this rule."

CHATTEL MORTGAGE TO SECURE PARTNERSHIP DEBTS.

One partner made a chattel mortgage to a trustee to secure the firm's creditors, the debt of each being specified, and he also put in the mortgage, specifically, the amount of his own debt to a creditor. One of the firm's creditors sought to foreclose the mortgage to the extent of his claim, and the defense was made that the mortgage was invalid, because the individual debt of the partner was secured thereby, and this contention was sustained. The case—Walker *vs.* White—was carried to the Supreme Court of Michigan, and there was reversed. Judge Morse, in the opinion said: "The mortgage was so drawn as to specify the amount of indebtedness to each creditor specifically, and the plaintiff was by its terms made trustee for the collection and payment of the amount owing to each. There is no legal objection to such a mortgage, and each mortgagee can enforce his own claim under the mortgage, the amount of his debt being stated. It is inequitable to defeat this right on the ground that the partner secured his own creditor."

LIBEL BY NEWSPAPER.

A newspaper company were sued in libel on this publication: "A young man named Frank Mallory, employed as a driver and collector by A. H. Gow, has disappeared with some of his employer's funds, and the police have been notified." The defendant justified the publication: 1. That it was true. 2. That it was made in good faith, and in aid of legal proceedings to arrest one charged with crime. The plaintiff had judgment, and defendant appealed the case—Mallory *vs.* Pioneer Press Co.—to the Supreme Court of Minnesota, where the judgment was affirmed. Judge Dickinson, in the opinion, said: "1. The publication charged an embezzlement, and it was shown that he had not absconded, and that he claimed the money he had collected to apply it on account of wages due him. So the charge was not made out. 2. The right to publish items of news does not go to the extent of allowing the publication of false and defamatory matter, because it is news, so-called. The claim that the publication was in the interest of justice was not set up in the answer, and, as no criminal proceedings had been taken, it is not a valid excuse here."

Submarine Rocks.—MM. Fouqué and Michel Lévy have made an examination of the rock brought up from the sea bottom by the sounding operations of the French ship Talisman in 1883. They were brought up from depths of from about 13,000 to 16,500 feet, and, having been cut, were examined by the microscope. The prevalence of scoria as from the furnaces of engines is very notable among the specimens, their ingredients being anorthite, olivine and oxydulated iron. On other specimens the imprint of stigmaria and sphenopteris can be distinctively seen. Two fragments of brick have also been found. A piece of common and a piece of hornblende granite are among the specimens, a pegmatite and some granules often rich in muscovite, and microdine. One of the granulites shows some grenat, and another numerous inclusions of actmote in the feldspars. These and some other eruptive rocks are found among the specimens, but the metamorphic series is more largely represented. There are 24 pieces of gneiss properly so-called, and 25 pieces of amphibolic gneiss. The former frequently contain zircon, apatite, tourmaline, biotite, muscovite and other minerals. The latter are found to contain, besides these minerals, others, such as pyroxene, diallage and enstatile. Besides gneiss, mica schists, quartzose schists and argillaceous schists, one of the latter specimens containing crystals of biotite and grenat, with numerous particles of graphite, labradorites, basalts, pumice and basic scoria, has also been found among the specimens; besides, many sedimentary rocks, such as limestone, marbles and arkose, were found, and blue globigerina mud filled up the outer cavities of the lava and pumice.

Merchants in Philadelphia and Baltimore alike are much exercised on the subject of alleged railway freight discriminations, particularly as concerns grain, to the advantage of rivals in the trade.

Substitutes for Steam.

In a paper on the above subject, read at the recent Chicago meeting of the American Society of Mechanical Engineers, Mr. George H. Babcock, after an historical treatment of the matter, briefly considered the principles underlying thermo-dynamics and their application to the inquiry.

In any heat engine, remarked Mr. Babcock, it is essential that there should be, first, a working fluid; second, a source of heat, and, third, a receptacle for unexpended heat, both of which latter must be external to the working fluid. In its operation there must be a reception of heat by the working fluid at a certain temperature, a conversion of heat into work and a discharge of unconverted heat at a lower temperature than that at which it was received. The difference between such higher and lower temperatures is called the "range of temperatures," and the engine is called a "perfect engine" when the whole heat corresponding to its range of temperature is converted into work. Sadi Carnot, in 1824, seems to have been the first to enunciate the principle now universally recognized that the ratio of the maximum mechanical effect in a perfect heat engine to the total heat expended upon it is a function solely of the two constant temperatures at which respectively heat is received and rejected, and is independent of the nature of the intermediate agent or working fluid, though at that day the dynamic theory of heat was not known, and Carnot supposed that all the heat received in the boiler or its equivalent was transferred to the condenser. Subsequent researches of Joule, Rankine and others have established the following propositions:

1. In any heat engine the maximum useful effect (expressed in foot-pounds or in percentage) bears the same relation to the total heat expended (expressed in foot-pounds or as unity) that the range of temperature bears to the absolute temperature at which heat is received.

2. In any heat engine the minimum loss of heat bears the same relation to the total heat expended as the temperature at which the heat is rejected bears to the temperature at which it is received, both being reckoned from absolute zero, 460° below the zero of Fahrenheit's scale.

These two propositions, expressed in algebraic formulæ, are: (1) $U = H\frac{T_1 - T_2}{T_1}$, which, if $H = 1$, becomes the well-known equation $U = \frac{T_1 - T_2}{T_1}$; and (2) $L = H\frac{T_2}{T_1}$ in which, also, if $H = 1 \ldots\ldots L = \frac{T_2}{T_1}$. But as $L + U = 1 \therefore U = 1 - \frac{T_2}{T_1}$, which is identical with (1) differently written.

At this point we need to divest ourselves of an idea which is common, and which naturally comes from the terms used, that "latent" heat is necessarily wasted heat—or, in other words, that if all the heat received was expended in elevating the temperature, instead of a large share of it going into the "latent" condition, we should be able to turn a larger percentage of it into power. It has been upon this erroneous supposition that most of the searches for substitutes for steam have been based. To show its fallacy, however, it is only necessary to assume that steam be furnished at 100° temperature—1 pound pressure, or 28 inches vacuum nearly—that it be worked through Carnot's cycle between that temperature and 320°—the temperature of steam at 75 pounds gauge pressure. The efficiency of this cycle would be, by above formula, $= \frac{780-560}{780} = 0.28$. The heat expended per pound of steam would be $220 \times 0.475 \times 772 = 80{,}674$ foot-pounds of energy, of which the engine would utilize 28 per cent., or 22,588 foot-pounds. There would therefore be required $\frac{1{,}980{,}000}{22{,}588} = 87.6$ pounds steam per hourly horse-power, and that in a perfect engine; but, working within the same limits, in a very imperfect engine, using water with its large latent heat, in actual practice, a horse-power is obtained for from 16 to 18 pounds, or about one-fifth the quantity of fluid. Latent heat must therefore be an efficient source of energy as well as sensible heat. That it is just as much so when working between the same limits of temperature was demonstrated by Rankine in a series of articles published in the *Engineer* in 1857. And, in fact, it may be said there would be no available energy if there was no latent heat.

We may perhaps make this point a little plainer by means of an illustration suggested by Carnot, which, though based upon the theory of the materiality of heat, is still just as true under the correct theory. In fact, the second law of thermo-dynamics is equally applicable to a ponderable body as to heat, and may be summed up in the well-known adage, "Water will not run up hill." Taking a building in which is situated a tank of water or any other fluid used to drive a water-motor upon a floor below, after which the fluid is discharged, whence it may or may not find its way to the sea level—the line of absolute zero—it is evident that the greatest possible effect obtainable in the motor engine is represented by the weight of fluid Q, multiplied by its fall to the point of discharge. The hight of the surface of the tank above sea level is T_1, and the hight of its discharge from the same datum line is T_2, while its fall is $T_1 - T_2$, and the greatest efficiency of the motor is expressed by $U = Q(T_1 - T_2)$. But the total energy of the fluid is represented by $Q\,T_1$, and the efficiency of the motor expressed in terms of total energy is $U = \frac{Q(T_1 - T_2)}{Q\,T_1} = \frac{T_1 - T_2}{T_1}$. It is evident that the same law holds good whatever be the character of the fluid in the tank. Now, the quantity Q, which may represent the latent heat, while the hight T_1 represents temperature, may be greater or less with the same hight. If $Q = O$, then there would be no available energy, for there would have been none expended. It will also be seen that if, in the supposed steam engine as above calculated, o be substituted for 0.475, the specific heat of the steam, there would be no energy in the engine.

From the mere inspection of the above formulæ, in view of this illustration it is readily seen:

1. That the useful effect can only equal the total heat expended when the temperature at which it is rejected is absolute zero, in which case it matters not at what temperature the heat may be received.

2. That with a given minimum temperature the higher the maximum temperature the greater will be the proportion of total heat converted into useful work.

3. That it is of greater importance to lower the temperature at which heat is rejected than to raise that at which it is received.

There are, however, practical limits to these several values:

1. The temperature of rejection cannot be carried below that of the substance into which it is rejected—in practice it must be several degrees above it—and is independent of the fluid employed. As there is nothing available colder than the air or water, T_2 cannot, in practice, easily be less than 100° F, 560° absolute.

2. The temperature of reception cannot be greater than the highest temperature of combustion, nor greater than the surfaces of the piston and cylinder will stand, nor greater than will produce in the given fluid the highest allowable pressure.

3. The highest pressure is limited by the strength of the mechanism and safety of its operation, and is also independent of the fluid. As all fluids except mercury attain this limit of pressure before the limit of temperature, the pressure is the practical limiting condition in this direction.

Obviously, then, as the limits of lowest available temperature and of highest practical pressure are the same for all vapors, it becomes evident that the fluid having the highest temperature at the limit of pressure, other things being equal, has the advantage, theoretically, in possible economy. Of all available liquids water fulfills this condition best, and therefore it is useless to search for another vapor as a substitute for steam, unless it can be shown that the losses incidental to the use of the latter are necessarily enough greater than those incidental to some other fluid to more than counterbalance this advantage. That there are such compensating advantages is not probable, and they would indeed need to be very great to offset the cost of fluid, water being free of cost in nearly all situations.

Were we, however, to look for a fluid to use in a "binary system," it must necessarily be among those which vaporize at a higher temperature than water, rather than, as has heretofore been sought, at a lower. In this way it might be possible to attain a higher range of temperature and thus gain something theoretically in economy, unless, perchance, the additional loss in the furnace should offset to a large degree any such possible gain.

It becomes evident, therefore, that a successful substitute for steam in motive-power cannot be found among vapors, and most probably, if found at all, it must be among permanent gases. By a bountiful provision of nature an equally free and exhaustless supply of a perfect gas—atmospheric air—has been provided which has several elements of value in the problem. As it requires 500° of heat to double its pressure at 39° F.—the point of greatest density of water—it may be heated to a very high temperature before it reaches a practical limit of pressure. It is a poor conductor of heat, and does not condense when cooled; therefore it will suffer less loss from being used in a cool cylinder. Being a supporter of combustion, the fuel may be burned within the working fluid, and the loss due to the furnace avoided. It also offers the opportunity of recovering a larger share of its rejected heat to be used again. In a steam engine the only use to which this rejected heat can be put is in heating the feed-water and air for combustion, and only a small fraction, not over one-sixth, can be utilized in that way, while with air Rankine estimates that as much as 90 per cent. of the heat in the exhaust may be retained for use by a device invented by Stirling, known as the "economizer" or "regenerator." There are disadvantages, however, peculiar to air, among which are its bulk and the necessity of initiating motion by external power. The former is overcome by compression before heating, and the latter may yet be provided for in some simple manner.

Air, then, gives the best promise for an economical substitute for steam in pressure engines. The development of its advantages involves many difficulties, but these are fast being overcome. The air engine of Stirling of 40 years ago equaled in economy any steam engine of its day, while the Shaw air engine of 1867 equaled in economy of fuel the largest and most perfect steam engines of to-day. The Otto engine and others of similar character exhibit an economy of heat double that of our first-class steam engines, but they are handicapped by the necessity of using a very expensive fuel, and are necessarily confined to small powers and special circumstances.

It is a singular coincidence that the best gas or air engines attain to nearly the same percentage of their theoretical efficiency as the best steam engines. Thus, a condensing engine working under 75 pounds pressure of steam and using 18 pounds water per hourly horse-power has a theoretical efficiency of 0.28, and an actual efficiency of 0.12 for the engine, or 0.09 for both engine and boiler, which latter is equal to 32 per cent. of the theoretical. An Otto or a Clerk engine, according to various tests, utilizes 18 per cent of the expended heat in power, working ordinarily between the limits of 2700° and 900° F. This would give a theoretical efficiency of 0.57, and these engines therefore attain to 31.6 per cent. of their theoretical efficiency, or practically the same as is done by the steam engine.

In this connection it may be of interest to note the rate at which the increase of the temperature of rejection demands an increase in the maximum temperature to maintain the same efficiency, as, for instance, the temperature and pressure of steam at which a non-condensing engine would equal

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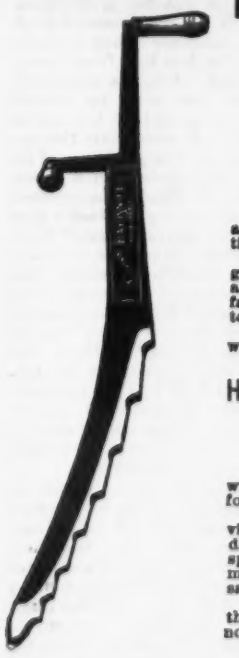

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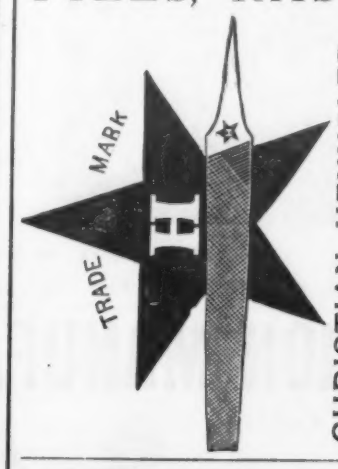

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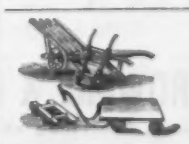

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a condensing engine under ordinary condition. From equation (1) we obtain $T_1 = \frac{T_2}{1 - U'}$ and by assuming $T_2 = 212 + 460$, with $U = 0.28$, as above, we have $T_1 = 933°$, or 473° F., which corresponds with a pressure of about 550 pounds, quite inadmissible in practice. It is not unusual to hear men say that the advantages of a condenser can be obtained by carrying 15 pounds more pressure on the boiler. The above shows the fallacy of this statement.

The prospect of much further economy in steam engines is not bright. By means of a non-conducting lining for the cylinder a saving might be effected of, say, 25 per cent. in fuel, bringing the efficiency up to 13 or 14 per cent., and by running the pressure up to 250 pounds we might attain possibly an efficiency of 17 per cent., or the same as is now attained in gas engines. In these, however, as now built, over 50 per cent. of the total heat is lost in the jacket and 17 per cent. in the exhaust, of which losses there is no good reason why we may not expect to save one-half, so that the air engine may attain to, say, two-thirds its theoretical efficiency. At the same time by reducing the lower limit of temperature the theoretical efficiency may be raised materially. Thus, if the minimum be lowered from 900° to, say, 300°, leaving the maximum at 2700°, as before, we will have a theoretical efficiency of 0.75, and if two-thirds of that be realized there will result an actual efficiency of 50 per cent. as that which may fairly be looked for in air engines. If coal can be utilized directly for fuel this will give a horse-power for an hour for ½ pound of coal, a saving of 78 per cent. upon the best results yet attained with steam. If, however, it is necessary to turn the coal into water gas before it can be used, double the amount of coal would be required, or ¾ pound per hourly horse-power, which is still a large advance on any possible attainment with steam.

Engineering Relics.

A short time since we recorded the fact that a Sun and Planet engine designed by James Watt was still in active service at Messrs. Whitbread & Co.'s Brewery, Chiswick street, London, although erected so long ago as 1785. A description of this interesting relic of the early days of mechanical engineering has since been given to the Manchester Engineers' Society by Mr. Thomas Ashbury, C. E., who recently visited Messrs. Whitbread's establishment and inspected the engine in question. This rare and complete specimen of an early steam engine is to-day, Mr. Ashbury states, in good working order. It is a low-pressure condensing engine of 70 horse-power, working with a maximum steam pressure of 10 pounds per square inch, its surface condenser giving a vacuum of 27 inches. A silver plate affixed to it gives the following epitome of the history of the steam engine:

"The steam engine was first invented by the Most Noble Edmund Somerset, Marquis and Earl of Worcester, 1655. Improved by Capt. Thomas Savery, 1699. Further improved by Thomas Newcomen and John Cawley, ingenious mechanicians, of Dartmouth, in the County of Devon, 1712. The expense in fuel reduced one-half by Mr. John Smeaton, F.R.S., of Ansthorpe, in the County of York, civil engineer, 1768. Greatly enlarged in its powers and uses and brought to its present state of perfection by Mr. James Watt, F.R.S., of the city of Glasgow, who received His Majesty's patent 1769, and in conjunction with Mr. Matthew Boulton, of Birmingham, F.R.S., obtained an act for an exclusive privilege for 25 years, commencing 1775. They erected this engine, which performs the work of 35 horses, 1785, but in the course of 10 years' use, more horse-power being found necessary, this engine was altered to make it equal to the work of 70 horses."

The engine runs for a week of seven days, and 24 hours per day, less meal hours, with a consumption of only from 12 to 14 tons of slack coal. On the same premises there is also an engine of Boulton & Watt's make, put down over half a century ago. It was designed and made as a marine engine, but subsequently came into Messrs. Whitbread's possession, and is now working with 10 pounds maximum steam pressure, and developing about 100 horse-power. Another interesting fact in connection with this brewery, which goes to make it somewhat of an engineering museum, is that the illustrious engineer Smeaton designed and erected for it six huge underground cisterns for storing beer in bulk, of which one holds nearly 4000 barrels and another about 3600 barrels. These will appear to belong to sufficiently ancient history when we say that they are known as the "King" and the "Queen" in commemoration of a royal visit paid to the brewery in 1787 by King George III and Queen Charlotte, with three of their daughters.

The new Government cruiser Boston, at Roach's shipyard, Chester, will join her twin sister Atlanta in New York about the middle of July, and the big Chicago, also at Chester, will be ready for trial in November. The Boston has an extreme length of 283 feet, her breadth is 42 feet and her depth 34 feet. Engines that indicate 3500 horse-power turn the screw, which at full speed is expected to send the formidable-looking cruiser through the water at the rate of 13 knots an hour. The Boston's battery will consist of four 8-inch guns throwing projectiles of 250 pounds, six 6-inch guns, four Hotchkiss rapid-firing guns, and probably six Gatling guns. The Boston is constructed wholly of steel, and will carry a crew of 300 men. The commanding officer will work his vessel from a circular turret of steel 6 inches thick by means of electric signals.

The nautical school ship St. Mary's, stationed at this port, is turning out a number of efficient seamen. Several letters from sea captains are published by the council who are responsible for its management, showing that the school is doing its work in furnishing the merchant service with a class of young men who will at no distant date fill the places of those compelled by reason of age and other causes to abandon the sea.

Foreign Markets.

FRANCE.

PARIS, June 17, 1886.—*Metals*—The demand has made normal headway, with a slight improvement in all Metals except Copper. We quote at the close, in francs, ₱ 100 kg.: *Copper.*—Chili Bars, 102.25 @ 105; Ingots and Slabs, 110; Best Selected, 112.50, and Pure Corocoro Ore 105. *Tin.*—Banca, 272.50; Billiton, 271.25; Straits, 270; Australian, 271.25, and English, 267.50. *Lead*, 32 @ 33.25, and *Spelter*, 37.25 @ 38. *Iron.*—The improvement in the Iron trade in France has made further progress. In this city there is great activity, the demand chiefly running on Flooring Iron, which has risen to 12.55, and Merchant to 13.50; Flooring may soon reach 14 @ 15 francs, the price at the North being 13 francs at the works. Sheeting Iron has been slow in following suit, No. 2 Common not yet bringing over 16.50 francs in this city. The encouraging feature is that speculation has nothing to do with the advance in France, brought about by an actual increase of consumption solely. Old Rails have advanced to 7 francs ₱ 100 kg. At the North the demand for Iron is such that it is difficult to meet it from the current output. In the Ardennes there is a pressing demand for Merchant at 13 @ 14. In the Haute-Marne an immediate general rise seems to impend, there being a most active demand. The only region not yet having caught the spirit of the hour is the Loire. *Coal* is moderately active and steady.—*Moniteur des Intérêts Matériels.*

BELGIUM.

BRUSSELS, June 17, 1886.—*Iron.*—The renewal of strikes in the Coal regions of Belgium is not considered serious enough to affect the Iron trade thus far, and prices remain steady as follows: Foundry Pig, Luxembourg, 4 francs ₱ 100 kg.; Charleroi, 5.75; Puddling Pig, Charleroi, 3.70 @ 4.70; Luxembourg, 3.80; Merchant No. 1, 10 @ 10.25 francs: No. 2, 11.25; No. 3, 12. Beams, 10; Angles, 11.50; No. 2 Sheets, 12.50; No. 3, 14.50; Commercial, 16.50; Thin, 18.50; and No. 4, 20.50. There continues at prevailing figures a steady local consumptive demand, together with a moderate run of orders for export. Prospects in general are still reassuring. European crops are fair, money is easy, and the political outlook was at no time more peaceful; as at the same time the situation is devoid of all excitement, as prices remain low, and are not interfered with by speculation, consumers not only fill their current wants without hesitation, but even anticipate them to a moderate extent, there being every inducement for them to do so. This being the case, there is no fear of our not bridging over the summer time with great ease, while toward fall the general aspect of the Iron trade in Europe may present elements of soundness and strength, and thus prepare an era of recuperation in values. *Coal.*—Is quite stiff and tending upward.—*Monteur Industriel.*

GERMANY.

HAMBURG, June 17, 1886.—*Iron.*—The better demand for Puddling Pig, Luxembourg and Thomas has continued without abatement, causing great firmness in all of them, Puddling Pig in particular, there being a further decrease of stock. While Spiegel is locally in request, it is still neglected for export. The production of it is comparatively restricted. Foundry Pig is neglected, the foundries complaining, and little is thought of Bessemer at present. In the rolling-mill branch Rod Iron and Beams are in request, building being tolerably active, but it is a business from hand to mouth. A better feeling now begins to prevail; prices are believed to have touched bottom. The mills turning out Boiler and Coarse Sheets have booked large orders, so that syndicate figures are made with ease. Thin Sheets, on the contrary, still tend downward for the lack of work. Wire Rods are sustained with difficulty, the demand not picking up. The Steel works have secured orders for Railroad Material for a couple of weeks to come, and expect to keep up their full capacity. In the machine shop branch orders are scarce, and limits low; this also refers to Boiler shops and Structural Iron. In Upper Silesia the price of Merchant Iron remains depressed; it is 90 @ 90.25 marks ₱ ton. *Metals.*—The proposed 5 % reduction in the Spelter output has not yet been internationally indorsed in full, but the Metal is very firm. A good demand is springing up for Copper.—*Borsenhalle.*

HOLLAND

ROTTERDAM, June 14, 1886.—*Tin*—The upward movement has made further progress, Banca advancing to 60.75 guilders ₱ 50 kg., spot, and 61 July and September auctions, while Billiton has been paid 60.75, spot.

Tin Statistics.

	May 31, 1886. Tons.	May 31, 1885. Tons.	April 30, 1886. Tons.
Banca in Holland, spot	990	1,906	643
Billiton in Holland, spot	539	1,339	539
Straits and Australian in London	5,922	6,089	6,087
Total	7,451	9,234	7,269
Afloat, Billiton	737	1,053	1,046
Straits	926	1,450	990
Australian	780	800	720
Total	9,894	12,537	10,025
American visible supply	2,180	1,150	2,400
Total	12,074	13,687	12,425
Price of Banca, florins	58¾	53	56¼
Price of Billiton, florins	58¾	52¼	56¼
Deliveries in Holland	561	582	609
Deliveries in London	1,288	1,404	1,475
Total	1,849	1,986	2,084

Charters and Shipments in April.	Tons.
Straits to London	875
From Australia to London	500
Straits to America	300
From Australia to America	50
Shipments from London and Holland to America	338

The Government returns for the month of March are as follows:

Export of Tin from Holland.

	March. 1886.	1885.	1884.
To Germany, Tons	486	449	397
England	2	2	....
Belgium	70	75	97
France	11	19	6
Hamburg	54	22	51
The United States	30	30	5
Other countries	23	48	102
Total	666	635	658
	Three months. 1886.	1885.	1884.
To Germany, Tons	1,471	1,211	1,176
England	39	15	51
Belgium	228	191	255
France	86	76	63
Hamburg	126	81	101
The United States	204	87	70
Other countries	60	82	154
Total	2,214	1,744	1,870

—*Koch & Vlierboom.*

SPAIN.

BILBAO, June 14, 1886.—*Iron.*—After a prolonged spell of dullness in Ore there has been a little more doing, without change in prices. Shipments of Iron Ore to date 1,432,005 tons, against 1,416,220 in 1885.—*Revista Minera.*

AUSTRIA.

VIENNA, June 13, 1886.—*Iron.*—The improved demand for Structural Iron and Coarse Sheets has continued, but Merchant Iron is not as active as it might be. The formation of the syndicate has so far merely stiffened prices. Hardware factories are the reverse of busy. The Government took at home 10,000 tons Rails and Sleepers. Iron prices are unchanged. Metals have been moderately active. We quote Copper, 55.50 @ 56; Lead, 18; Spelter, 19, and Tin, 129 @ 131 florins ₱ 100 kg.—*Austrian Trade Journal.*

CHILI.

VALPARAISO, April 30, 1886.—*Copper.*—Since our report of the 16th inst. business has been interrupted by the Easter holidays, smelters only offering a few lots after they had passed, and obtaining an advance in consequence of the favorable exchange, the price paid being $18.40, equal to £41. 14/5. Sales, 8950 quintals at $18.35, and 2000 Lambert, $18.65. *Nitrate.*—Advices from Europe being unfavorable, hardly anything transpired for that quarter, but the good demand for the United States has continued unabated. Sales, 230,000 quintals at $3.17½ for 95 %, which equals 8/5 ₱ cwt. in England. *Coal* has been unaltered; Newcastle West Hartley Steam, 19/; Orrell, 17/; Australian, $7.62½, and Smelting, $7.50 @ $8. *Exchange* has declined still further to 22¾d.—*Weber & Co.*

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IMPORTER OF FINE RAZOR HONES.
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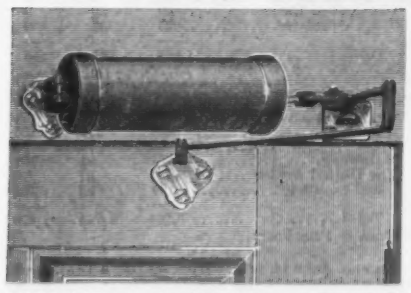

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SCREW DRIVERS
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PATENT COMBINATION WRENCH.
Case-Hardened Throughout. Parts Interchangeable.
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No. 3 PATENT PIPE WRENCH.
The serrated jaws of the Wrench are interchangeable; that is, the same serrated plate may be used for either the stationary or sliding jaw, so that if one plate is broken another can be furnished adapted to either jaw without express designation. The slides, nuts and various parts are also interchangeable, thus easily repairing the Wrench at very small expense, and with as perfect practicability for further use as when the Wrench was new.
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Communications by letter will receive prompt attention.
Jacks for pressing on Car Wheels or Crank Pins made to order.

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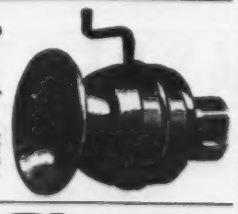
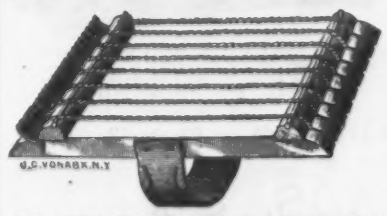


JAY-EYE-SEE



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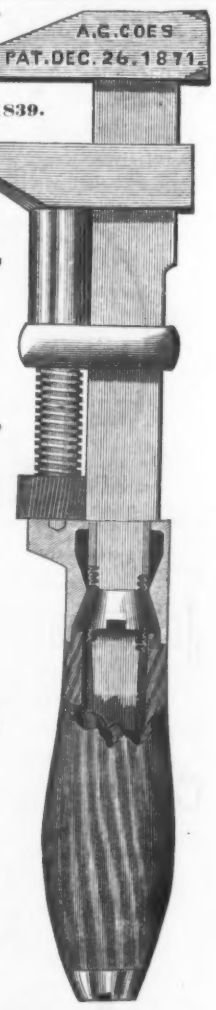

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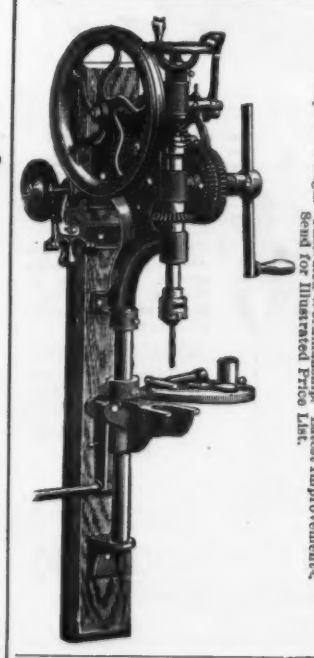

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Superior Design. Unrivaled Workmanship. Latest Improvements.
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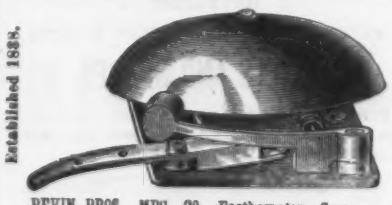

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The Invention of Machines.*

There are strong grounds for thinking that the simple fire-drill or twirling stick of early man, which could scarcely be called a machine, was the first example of machinal motion, though the motion was not continuous, but alternating, and it was no doubt long after that continuous rotary motion was introduced. Whether this latter first occured in the mill for grinding corn, which passed through the various stages of the simple stone, the pestle and mortar worked first by the female slave, then by bondsmen, and afterward by cattle, consummating in the flat cylindrical stone with vertical spindle, which was a true, though primitive, machine, or whether in some simple contrivance for drawing water or for other domestic purposes, it is impossible to say. At any rate, the first machines were actuated by the muscular effort of men and animals, and, though the use of the latter evinced considerable progress, it was a far greater step when the forces of nature other than muscular were first employed to do work in machines. No doubt the power of flowing water was the first so used, probably about time of Mithridates, though the Chinese used water-wheels at a very early date. The use of the still more uncertain and refractory element wind showed a still further advance, and there is apparently no mention of windmills in the classics; indeed the first authenic record of such occurs of a mill in France in the year 1105, one in this country being mentioned about the year 1140.

The greatest difficulties of all were experienced in utilizing the molecular motion of heat to actuate machines, but the successful accomplishment of this has led to results which are incalculably great. The history of all important classes of machines is similar to that of the steam engine, and the experiences of their inventors much the same as those of inventors of the steam engine. This might be proved by a study of the progress of textile or printing machinery, machine tools, instruments and machines for measurement, modern weapons of war, and a variety of machines of other kinds. Time does not, however, permit more than a statement of what appear to be the salient features common to the history of them all. The first of these seems to be that progress does not, as a rule, take place in the direction of simplification, but rather from simple to complex forms, accompanied by more definite, reliable and constrained machinal motions, in proportion as the machine becomes capable of performing more extended operations and accomplishing them by itself, requiring less human intervention—that is, becomes more automatic and self-regulating—so that the parts multiply and complexity increases. This Professor Kennedy, in his translation of Reuleaux's work, has called an extensive and intensive growth—extensive in increased range of operations, and intensive in increased internal power of action. It is most important to avoid mistaking the unnecessary additions which any inventor may introduce in the particular form that the invention takes in his hands, and which additions he may possibly ultimately discard himself with the progress of the essential parts of the machine as a whole. Not less important is it to distinguish between apparent and real complexity. Complexity does not mean mere multiplication of parts, but the addition of arrangements which perform special operations, or have certain functions which give the whole a greater completeness, as, for instance, in the case of the modern sewing machine, the Maxim machine gun, or, perhaps best of all, the modern condensing steam engine, with its automatic expansion and reversing gear, automatic lubricators and other important additions.

Neither must the idea of any machine as a whole be confused with that of the separate arrangements which it contains, and which in themselves constitute perfect and complete machines. Taken by themselves there are undoubtedly an enormous number of simple machines which in the process of their evolution have been shorn of unnecessary parts. Such machines are of course made more simple by this, but it is the skill of that most complex structure, man, which is required to use them if complex operations are to be performed. Before such machines can become automatic in their action they must be made complex to an extent depending on the nature of their work. Now the tendency of progress is ever in the direction of replacing manual labor by machines actuated by the other forces of nature—that is, the tendency is in the direction of making machines more and more automatic, self regulating and self-contained, and probably there is no branch of industry that does not corroborate this statement in a more or less marked manner. This must lead to complexity in machines in the sense which the author has in view, as contrasted with the addition of complications of redundant or badly-constructed parts, which latter make the machine less efficient and reliable, while the former are essential to its increased power in enabling the required determinate motions to be obtained. The second conclusion which may be drawn from the history of machines is that their progress depends upon the growth of the other arts and sciences. This may seem obvious, but it is nevertheless a point often overlooked.

Lastly, it is clear that machines are not as a rule the product of the genius of one man alone, but of the sucessive labors of many minds, and are a growth rather than a sudden creation. The same remarks made above might be here repeated with regard to what is meant by machines in this statement. No doubt many simple machines are made and perfected by one inventor, but the completed machine is arrived at even then by a gradual process. In the great majority of cases, however, in which this is apparently the case, the inventor really started from the vantage ground of the results of the previous worker. This was eminently the case in the development of the steam engine. But to take another example; the dynamo, which as a machine is very simple, is quite a modern invention, but before Siemens, Gramme and others evolved the well-known machines bearing their respective names, Pixü had in 1833 constructed a magneto-electric machine in which the magnet revolved and the coil was fixed, Saxton had improved on this with a machine in which the magnet was fixed and the coil revolved, and Clarke had again improved on the machine of Saxton. The study of the history of machines shows us incidentally how the typical inventor has worked. He has some object in view which he strives to accomplish. In some rare instances, as in the case of James Watt, he studies the scientific principles, but even then the process of invention is more or less a groping in the dark on some of the steps in which the light of scientific knowledge is flashed, while in most cases it is in almost total darkness. Thus, as Reuleaux has pointed out, there arises that reverence for the inventor which is greatly due to the fact that he has succeeded by a process which is unintelligible even to himself. The result of this absence of scientific method is shown by the fact that the lot of the large majority of inventors is simply failure. The statistics of the Patent Office furnish striking testimony to this assertion.

As machines multiplied some classification became necessary, and attempts were made to effect this. Reuleaux in his sketch of science considers Leupold to be the first to separate (in 1724) single mechanisms, but that nothing like a system was formed until quite the end of the eighteenth century; he proceeds to review the various attempts to found a science of machines upon fundamental principles, but it must here suffice to say, though each worker has taken a part in the progress of science, yet no one succeeded in founding a system which has had a practical application, and we therefore come at once to the system of Professor Reuleaux himself, as set forth in its latest form rather more than 10 years ago. The deep and far-reaching principle upon which the system of Reuleaux is based is that of the mutual contact of the moving parts of a machine. In all cases these parts must have the property of mutual envelopment if their relative motion is to be constrained and definite; and this correspondence or pairing, which is an essential feature of the machine, leads to the statement that a machine consists solely of bodies which thus correspond pair-wise reciprocally. Pairs join together links, and links form a chain, and a chain is a machine. It is by the combination of chains that any and every machine, no matter how complex, is formed. This method of viewing the machine problem leads to a matter of the greatest importance, viz., the construction of a "notation" for machines upon scientific principles. Previous attempts to introduce symbolical representation of machine parts had only been partially successful, even for trains of wheelwork, while for general purposes they had been eminently unsatisfactory. The value of Reuleaux's system is shown by the concise way in which it represents the remarkable results of his analysis of machines, and puts the otherwise impossible task of understanding, at any rate, the leading features of all the various machines within measurable distance of being grasped by the human intellect. But more than this is done. After analyzing a large number of machines, Reuleaux concludes by what must be regarded as the first effort to found a system of kinematic synthesis or building up of machines—in other words, of their invention.

This part of the subject is that with which we are now directly concerned, but it must be confessed that it appears to be the least satisfactory portion of Reuleaux's great work, and this, with our present object in view, is certainly disappointing. Perhaps the reason for this is to be found in the fact that the motion to be obtained, though it truly forms the practical object he sought, can, after all, only be carried into actual operation by practical means. In short, the definite and constrained motions sought after can only be obtained by employing suitable materials of the necessary strength. The progress of knowledge concerning materials has already been shown to have always borne an intimate relation to the progress of machines, and obviously upon the scientific application of this knowledge must further advance depend. Reuleaux, it is true, introduces the idea not merely of rigid solid bodies and flexible solid bodies (as belts, cords, &c.), as Willis had done, but also fully considers, from a kinematic point of view, the machinal properties of liquids and gases, and one of the most important and interesting parts of his work deals with this subject. This is a great advance, but still there is an immense field untouched by this system, as, for instance, the nature of the best forms to be given to the links, or, most important still, the actual effects from the contact between different materials, the nature of which very often entirely decides the fate of a new machine. On these points our knowledge is yet far from complete. In addition to mere motion and the question of materials, the scientific application upon which the forces of nature can be made to overcome the resistance to the required motions in the machine have frequently to be considered by the inventor.

These three branches of knowledge now considered—viz., motion in machines, the nature and strength of materials, and the forces which are required to actuate machines—are studied under the heads of mechanism, machine design, and prime movers, and collectively represent the present state of the science of machines. It must therefore be admitted that the statement at the beginning of this paper is correct, and that no definite science exists which can be directly applied to the invention of machines. When the difficulties in the way of such a science are realized it may be perhaps doubted if its ultimate establishment is possible, and if invention can be performed scientifically, not to say by rule It is well, however, to remember that chemical science only a few years ago was merely analytical, but enormous advance has been made in the establishment of laws by which synthesis, or the building up of compounds, could be scientifically performed.

* From a paper by Prof. Hele Shaw, read before the Liverpool (England) Polytechnic Society.

New York's defaulters living in Canada comprise John C. Eno, whose house rent in Quebec is $2000. Tom Fields, lately de-

ceased, of the Tweed *régime*, lived handsomely on the banks of the Ottawa. Hinckley, the cashier, is believed to be in Winnipeg, engaged in mercantile operations. Henry Legget is said to be at Port Arthur. Then there are the boodle statesmen, Charlie Dempsey, Bob De Lacy, John Keenan, the Bismarck of New York City Hall, and Billy Moloney, all staying in Montreal, where they have the best the city affords.

English Letter.

(*From Our Regular Correspondent.*)

LONDON, June 14, 1886.

THE SITUATION

has not undergone any variation of importance, but it may be said that in a general way the incipient improvement which had begun to make itself felt in several lines of trade has received a check through the political crisis which has taken place since I last wrote. The rejection of Mr. Gladstone's home rule bill was regarded as being a very probable contingency, but not as a certainty, so that the actual defeat of the measure has in a sense come as a surprise. It is pretty certain that the general election will soon take place, and, consequently, we shall have a month or six weeks of heated controversy, during which the whole country will be ablaze with political passions, and useful business will be neglected. There seems to be no help for this unfortunate state of affairs, so that we have to take the medicine and do the best we can under the circumstances. Meantime a great deal of useful legislation is hung up, simply because Mr. Gladstone preferred heroics to real utility. The railway rates bill, which was designed to check the rapacity of the railroads, will be abandoned and our English traders must struggle on as best they may under terribly real burdens, while the country is going raving mad over home rule. Then, again, it appear certain that the new tariff convention with Spain will not be confirmed by our Parliament, so that the Spanish opponents of the measure will have time to rally their forces, and our goods sent into Spain will continue to be charged duties from 20 % to 45 % higher than those levied on French, German or Belgian products. Other useful measures for regulating mining royalties, sanitary registration, and so on, will be similarly suspended.

So far as the iron trade is concerned the few fluctuations of the week have not been unfavorable, rather more orders having been given out in several branches of the trade. The furnace manipulation at Glasgow has given a little more strength to Scotch pigs as well as to warrants, but there is no solid bottom to the movement up to the present time, inasmuch as nobody feels sure that the blooming out will prove lasting. With the reserve stocks constantly increasing by from 3000 to 6000 tons a week, it is not reasonable to expect any marked improvement in values, seeing that the enormous surplus must and will help the market bears to keep down selling prices. In the Cleveland district I hear, once more, there is a strong sentiment in favor of an augmented restriction of the make of pig iron, but those who advocate it are waiting to see how the cat jumps at Glasgow prior to again raising the question. When that does take place I shall expect to witness another *fiasco*, unless something happens to force certain firms into the proposed combination. Steel-rail matters are touched upon lower down in this report, but I may say here that some of the English concerns are beginning to repent the breaking up of the International Association. In some cases the current quotations are said to involve a loss of 10/ ℔ ton (I do not believe it myself, but the assertion is made), and those who feel it would like to know how it can be avoided. One prominent member of the trade thinks he has discovered a method of reuniting and reconciling the opposing factions, but I fear his optimism is wholly misplaced. I happen to know from very good authority that the Germans would not rejoin any combination unless on much stricter and better terms than before, while two of our rail concerns are also credited with the intention of "running loose" as long as they are able to do so. They, or one of them, at all events, broke away from the association in a most deliberate manner, and they could not well thus early try to effect its reconstruction.

The present week will be a blank in many parts of the country from a business point of view. Whitsuntide is the greatest holiday of the whole year in Yorkshire, Lancashire and the whole of the North of England. To day, Whit Monday, is a statutory bank holiday, and to-morrow is a sort of off day, on which nothing is done. Virtually the whole week is broken, and many of the works will stop, and do so gladly, until next Monday.

THE IRON MARKET

has again been flat and dull, and no improvement worthy the name has taken place. The blowing out of furnaces in Scotland, making the number at present in blast 84, as against 92 a week or two ago, has undoubtedly contributed to the small advance that has characterized the Glasgow warrant market within the last few days, but the conditions of trade generally do not in the least indicate a turn of the tide. On the contrary, it is probable that more furnaces will be put out of blast before long. It is significant that among the firms who have just laid idle some of their furnaces there are those who make the best and those who make lower grade brands, while at the time the quantity of iron being delivered into store is maintained at about the rate that has ruled so long. Taken altogether, it would appear that the attempts at restriction are experiments rather than the acknowledged results of necessity, and also that they are but the precursors of concerted action that will be shortly again proposed, and most likely adopted. A disposition to do something is growing among those who have the most to lose, and it is not at all unlikely that, should it be found necessary, a course tantamount to a mild coercive policy will be taken. This would not only apply to Cleveland and the West Coast, but also to Staffordshire, and even to South Wales. In short, it is now being recognized that a more or less permanent restriction to about 25 % is the only panacea for the woes of an encumbered market. At Glasgow shipments, though fairly good during the week, have been below the average, while at closing warrants stood at 39/1. In Cleveland the ruling tone has been less despondent, but the cheerfulness has been due to an imaginary rather than to a real improvement. For No. 3 29/6 is still quoted. Of buyers there are many who would like to contract for long forward deliveries (some evidence that prices are near the bottom), but holders decline to sell beyond three months or thereabouts, believing that something better will soon be ruling. On the West Coast the situation remains as before, with the exception that a few furnaces have been blown out and that prices have only been nominally maintained. In Staffordshire the condition which has long prevailed still rules, with rates nominally as before. The wire and galvanized industries continue in a state of extreme inactivity, and the same remark applies to the manufactured departments. Old scrap iron has been quiet, owing to the scarcity of supply. Prices are: Old double-headed iron rails, £2. 7/6 @ £2. 10/, No. 1 heavy wrought scrap, £2 @ £2. 2/; old iron boiler tubes, £2 @ £2. 2/; old leaf-spring steel, £2. 7/6 @ £2. 10/; old cast iron, £1. 17/6 @ £2; old flange rails, £2. 7/6, f.o.b. London or other British ports. Freights for pig iron from Glasgow to New York by ordinary steamer are a shade better this week, being again 5/. Steel continues in fair demand, but many of the works are only poorly employed. It is expected that further inquiries for armor plates will be shortly issued by the Government, which will be welcomed by makers, as the work now in hand is mostly for early delivery, and the state of the order-books is not all that would be desired. Steel sleepers are for the time being rather dull. Steel rails have been in much request, although in comparatively small lots. The price—from £3. 10/ to £3. 12/6—both for double-heads and flanged sections is tempting enough to buyers, particularly to the English railway companies, some of whom are desirous of letting contracts for three years, which, of course, makers are not disposed to take. The order for the 10,000 tons required by the Great Northern Railway Co. has been divided between the Darlington Iron Co., Limited; Charles Cammell & Co., Limited, and Steel, Peech & Lozer, at prices ranging from £3. 17/6 to £4. 1/, delivered either at Doncaster or Retford or in London. The North-Eastern Steel Co., Limited, have taken a contract for 10,000 tons for the Caledonian Railway, at about £3. 13/, f.o.b.

SCOTCH PIG IRON

has been a trifle better, owing to the slightly decreased production, somewhat improved shipments and the rumors as to further restrictions of the output. Some of the special brands are alike higher in price, but there is no evidence whatever that the consumptive demand is in any way stronger. There are now 84 furnaces blowing in Scotland, as against 92 a year ago. In Connal's stores there are about 774,000 tons, compared with 598,066 tons this date last year. Shipments to date are 33,000 tons behind, while imports from Middlesboro' are 34,000 tons in arrears. Current prices:

Deliverable alongside.	No. 1.	No. 3.
Gartsherrie, at Glasgow	43/6	41/
Coltness, "	46/6	42/6
Langloan, "	43/6	41/6
Summerlee, "	45/	41/
Calder, "	46/	40/6
Carnbroe, "	42/	39/6
Clyde, "	42/	39/6
Monkland, "	39/6	36/
Quarter, "	39/6	35/6
Govan, at Broomielaw	39/6	36/
Shotts, at Leith	44/	43/6
Carron, at Grangemouth	47/6	44/6
Kinneil, at Bo'ness	...	42/
Glengarnock, at Ardrossan	42/	39/6
Eglinton, "	39/6	36/6
Dalmellington, "	41/	37/6

THE BOARD OF TRADE RETURNS

for May are not very cheering, as they show a decrease in the imports of £2,165,060, and in the exports of £844,000. The total value of the iron and steel exports was £1,841,689 (although the quantity was slightly higher), as against £2,007,636 in May, 1885. For the first five months of 1886 the value of the iron and steel exports was £8,788,666, as compared with £8,443,039 in the same period of 1885, and £10,426,234 in 1886.

SPELTER AND ZINC.

The following excerpt from the *Ironmonger* (London) of June 12 may possibly be of interest to some of your readers: "It is by no means an easy matter to arrive at a clear understanding as to the position of spelter and of sheet zinc. As our readers are aware, the market for some time past has been weak, and, in view of the fact that the demand for spelter for galvanizing purposes has seriously fallen off so far this year as compared with the quantity taken by consumers during the corresponding period of last year, and that there has been a serious diminution in business experienced by some of the leading intermediaries in sheet zinc, it is perhaps hardly surprising, from an English standpoint, that values should show no strength, but rather the opposite. These two considerations are the main factors that have brought about the weakness in values, and upon these some dealers base the opinion that the market is only taking a natural course. There are others, however, who take an opposite view and think that present prices are below what the position of the metal warrants. They point out that the stocks of spelter and zinc in this country are practically *nil*, and that if the consumption here has fallen off it is fully equal to that of 1884, and that if the quantity in private hands and in warehouses here and on the Continent is a heavy, though an unknown, quantity, the stocks in makers' hands—including that kept on account of purchases already made—are considerably lighter than that at the same time last year. They therefore claim that the metal ought really to be in a stronger position than it at present holds, and they support their opinion by instancing the fact that the arrangement arrived at last year by the leading producers, both here and on the Continent, to confine their output to that of 1884 has sufficed, in spite of the depression in trade, to reverse the relative posi-

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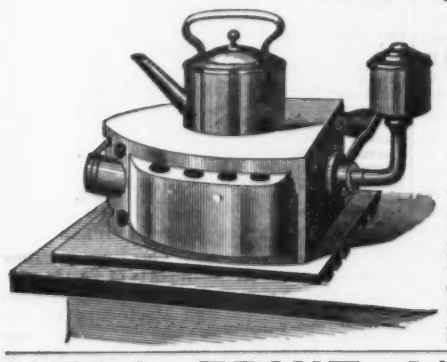

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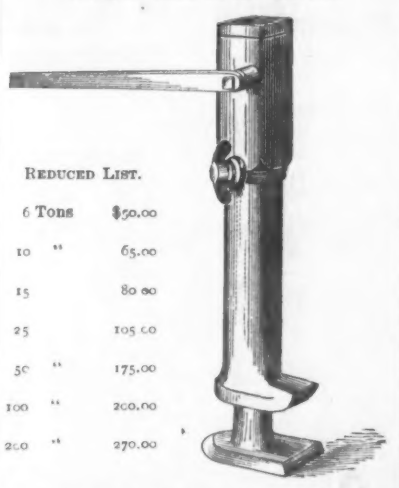

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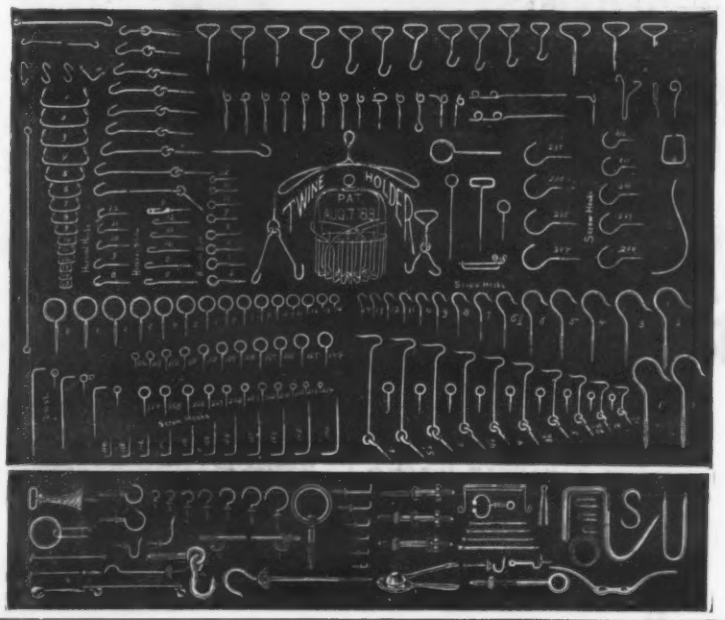

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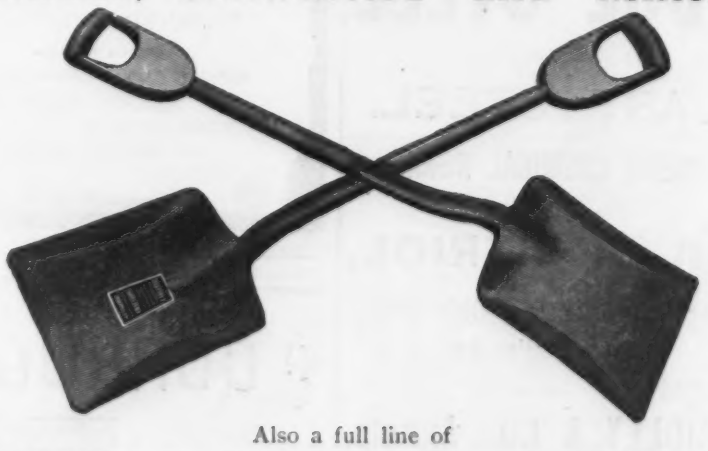

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tions of supply and demand. Again, they claim that the outlook has improved materially in consequence of a recent agreement between all the Silesian and other Continental producers to restrict their output another 5 %. While thus presenting the two views entertained, we would remark that in spelter, as in tin and copper, the latter especially, there are certain factors which exercise a considerable influence on the market, and until they can be fairly weighed it is impossible to form a definite and reliable opinion on the actual situation. It may be that the decline has been brought about by a falling off in the demand, or it may be that the appointment of agents in London by some of the leading producers has so distributed the business that individual firms of standing have only lost where the new men have gained, and that the mere increase in the competition for orders has directly tended to weaken the market. At the moment the market in London is dull, with ordinary brands obtainable at £13. 15/ @ £14, and specials at £14 @ £14. 2/6."

THE HARDWARE TRADES.

In London the fine weather experienced during last week sufficed to bring about a little more life in respect of the demand for domestic requisites, &c., for summer, but, generally speaking, the home trade is pretty much the same as it was a week ago. Taken in the aggregate, the business doing by the leading retail houses in the metropolis is probably, as regards bulk, at least about up to the average of last year. The export market shows no change, and as a rule actual orders are quite out of proportion to the inquiries about. The Cape trade has shown a little more life, but the Australian markets are at the best only steady. Builders' ironmongers report matters as rather quiet, and, in fact, it would appear that for some reason or other building operations in London and provinces as well are not being conducted even with the life shown during the last half of last year. That this is so is evident from the limited demand for sheet zinc. At Birmingham business on home account continues very sluggish, and even the Whitsuntide holidays have not given much stimulus to the lighter furnishing and traveling goods. In the shipping department there is an improving inquiry for miscellaneous hardware for India, Canada, the United States, France, Brazil and the West Indies. Machinists and engineers still complain of the serious decline in the foreign and colonial demand, more particularly for steam engines, which is by no means counterbalanced by the larger orders from the United States, Brazil and Canada. Mining tools are in request both for the Cape and Australia, in connection probably with the new gold discoveries, and Egypt is just now a large and active market for constructive ironwork, irrigating machinery and furnishing hardware. There is a fairly steady demand for iron for Australia, India and South America. At Sheffield, in some of the light branches, there has been somewhat more briskness in the country trade. Orders for spring cutlery, razors and electro ware have been more extensively booked by travelers, and other orders have assumed somewhat large proportions. There is not, however, any corresponding activity in the metropolitan trade. The best aspect of local trade is in the foreign and colonial department, which, bad as it is in comparison with the business of two or three years back, is not wholly without encouraging features. Excellent orders for steel and cutlery continue to reach us from the United States, and as in each case quality is a *sine qua non* they are orders of the type which manufacturers most desire to have. The Continental business gives but little encouragement, but indents from India are described as somewhat larger and more numerous, more particularly in spring knives and tools. Colonial lines show a tendency to grow again, but orders of size are scarce.

TIN PLATES.

In London the market is unchanged. In Liverwool there is a steady, though quiet, business still doing in tin plates. During no period in the history of the trade has such a thing been known before, as it was usual for plates to advance whenever tin advances, as it does now. However, the present stagnation in prices cannot very well be altered until the supply is brought a little more within bounds and somewhat nearer to the actual demand. Several large inquiries have come to hand during the last few days, and these will all mean new business, as they are chiefly specialties as to sizes and substances, and cannot very well be shipped from stocks. The exports during last month have again been very large, stocks having thereby been reduced to the extent of another 50,000 boxes, which, added to the 90,000 boxes reduced in April, bring the present stocks down to about 200,000 boxes. The inquiries this week run for the most part on Bessemer steels and Siemens steel plates, both with coke finish, and for these some well-assorted specifications are to hand. There are also some good inquiries for coke tins, many of these being for the various Continental markets. The demand for charcoal tin plates, both in Bessemer and Siemens steel qualities, is rather light, good and well-assorted specifications being scarcer than usual. Prices, generally speaking, may be said to be as follows: Bessemer steels, 13/6 @ 13/9 IC; Siemens steels, 14/ @ 14/3 IC; coke tins, 13/6 @ 13/9 IC; Bessemer charcoal tins, 14/6 @ 15/6 IC; Siemens charcoal, 16/ @17/ IC, and best charcoals, 17/6 IC. Ternes are quoted from 12/6 to 14/6 IC, in accordance with brands; coke tin wasters, 12/3 @ 12/9.

Consul Warner, at Cologne, has prepared a report on the condition of the laboring classes in Germany, in which he says that the wages of a laborer, whether he works in iron or steel manufactures, coal mines, stone quarries, on buildings or railways, ranges from 47 to 70 cents per day, and if he is a skilled laborer from 80 to 90 cents per day. Female labor is only allowed in a certain limited degree, and is only paid from 24 to 30 cents per day. Working hours are from 6 to 6 in summer and from 7 to 7 in winter. One hour is given for dinner, one-half hour for breakfast, and half an hour for coffee in the afternoon. The Government has no power to regulate or interfere with working hours, but it takes care that certain restrictions with regard to the employment of women and children are observed. Rent is $2.85 per month on the average, or one full week's wages. Meals cost 24 cents per day. They consist principally of potatoes. They have also peas, beans, vegetables, common pork and black bread. Once in a while they have dried fish and beef, but more often horse flesh. The laboring classes are poorly clothed as a rule.

The Tensile Strength of Steel Rails.

The *Railroad Gazette*, in an article on the tensile strength of steel rails, quotes the following series of tests made by the Detroit Bridge and Iron Works for J. D. Hawks, chief engineer of the Michigan Central Railroad, on entire rail-heads, cut from rails taken from Michigan Central tracks after more or less service, simply planing off the web:

Make of rail.	Area. Square inch.	Ultimate strength per sq in.	Elastic limit per square in.	Elongat'n in 8 in. Per ct.
		Lb.	Lb.	
N. Chicago R. M. Co., 1885	3.30	94,899	59,300	6.26
N. Chicago R. M. Co., 1885	3.32	38,400	61,600	....
Cammell Sheffield toughened steel, 1881	2.70	81,000	.....	2.34
Cammell Sheffield toughened steel, 1881	2.66	80,400	.....	1.56
A. & R. I. & S. Co., 188—	3.18	73,100	51,400	3.13
Edgar Thomson, 1883	3.35	70,300	.....	....
Albany & R. I. & S. Co.	3.22	66,000	.....	2.34
Griswold & Co., 1872	2.55	63,200	.....	....
John Brown, Atlas, 1873	2.56	60,500	.....	....
Joliet, 1884	3.33	57,200	.....	....
N. C. R. M. Co., 1875	2.81	54,600	.....	....
Cambria I. Co., 1872	2.40	54,200	.....	....
Joliet, 1884	3.30	53,500	.....	....
C. I. Co., 1872	2.51	50,600	.....	....
J. A. Griswold, 1872	2.26	45,300	.....	....
Edgar Thomson, 1883	3.28	44,400	.....	....
John Brown, Sheffield	2.42	43,500	.....	....
N. C. R. M. Co.	2.73	42,000	.....	....

The rail of the North Chicago road was tested to 90,000 pounds per square inch, and again to 78,000 pounds per square inch, without breaking, the wedges of grip giving way both times. It was not broken on the final test, but had drawn down so much in the grip that the wedges were pulling through and resistance was diminishing. The *Railroad Gazette* adds: "These tests were for rails which were in some cases practically new, but in others had seen a dozen or more years of service, and in all cases they included the entire head of the rail, without other work being done on it than to plane off the web. The wear is rudely indicated by the area of the section, and great allowance should plainly be made for the effect of years of service on the molecular condition of the metal. But after making all allowances the contrast is striking. It will be seen that only in four or five cases was there enough elongation to be worth determining. The record shows, as appears also from a box of the broken specimens in this office, that for the most part they broke short off like a piece of cast iron, except for the higher strain. This does not by any means necessarily imply that the rails are bad, as it would if they were eyebars; on the contrary, we know that some of them which are far down on the lists were very good indeed, while others which are well up in it were passably bad. What it shows is the futility of the method. The true moral of the tests is indicated by what Mr. Hawks says in his accompanying note: 'The more I see of our poor steel rails, the more I am convinced that the tests are too much like those for wire rope or cable, and that tests suitable for wire rope are not suitable for steel rails.'"

The Recent British Gun Explosion.

After all the stir that has been made about the recent gun explosion on board the British war ship Collingwood, it seems as though little would be done to bring about the needed change in English gun designs. Concerning the subject we find in a late issue of *Nature* (London) the following, which requires no comment: "The failure of the Collingwood's gun raised hopes in the minds of many that at last a proper inquiry into the question would be held; but it has been referred back to the same committee, associated with the same civilians (except Mr. Leece, who is dead), who recommended that the gun should remain unaltered, but that the charge of 295 pounds of cocoa powder should not be exceed. They therefore are to sit in judgment on themselves, and, if they relied on the same data when recommending certain additional strength should be given to other guns as they did when merely limiting the charge of the 12-inch, what reason is there for supposing that the results with other guns will differ from this one except in loss of life and damage done?" Another English paper remarks: "The explosion of the 43-ton gun has led to the appointment of a committee of inquiry, in which the name of Mr. Anderson is conspicuous by its absence, although surely no greater authority on the points at issue exists. A year ago, in his important lectures at the Society of Arts, he drew attention to the want of relation between the sections and pressures, and predicted disasters."

The agitation for standard specifications for bridge materials has only just begun in this country. In Germany a committee of the two leading engineering societies, and of the association of German ironmasters has recently published its specifications, after having labored since 1881.

Under date of April 27th, 1886, a patent for a wire nail machine has been granted to Clinton Lovell, of Boston, who has assigned it to the Albert Nail Co., of New York. He has also patented a die for wire-nail machines.

It is reported that a syndicate of Philadelphia and Pennsylvania capitalists is about to purchase the Valentine iron-ore property in the Kittany Valley, near Bellefonte, Centre County, Pa. A new furnace plant is talked of.

(*Concluded from page 1*)

stop V it is turned to an upright position, and is therefore in the proper position to be driven by the rollers into the pass *i* without turning or further manipulation. The rail-bloom after going through the pass *i* runs out on the table N, and then its rear end is raised by means of a lever hook or otherwise to the pass *k*, through which it is driven. As its latter end leaves the pass *k* it falls to the table M, but in its descent it encounters an inclined guide, shown in Fig. 3, which shunts it sidewise, so that it falls on the table directly in front of the pass *l*. The feed rollers turning in the direction of the rolls then carry the bloom directly into that pass.

If desired a similar guideway may be arranged between the passes *m* and *n*. The bloom having gone through pass *n* and run out on the table N, the rollers of the latter are stopped by throwing the center friction-wheel out of contact with the wheels. At the rear end of the table N is a track, W, which extends also over the rear feed table of the finishing rolls C. Mounted on this track is a carriage or pusher which is operated by a chain or rope. The rope is mounted on sheaves placed at the end of the track, and is actuated by a drum, Y, around which it passes one or more times. The drum is mounted on a shaft journaled in a sliding bearing, and is provided with a friction-wheel at the other end, which wheel is situated between two friction gear wheels, and is capable of being thrown into contact with either or out of contact with both. The bearing is moved by a lever, with which it is connected by a rod. By throwing the wheel in contact with one of the wheels the carrier is caused to move in one direction; and by throwing it in contact with the other the carrier is caused to move in the opposite direction. When the rail bloom leaves the pass *n* it is very much elongated, and its end extends past the carrier, the latter being in its retracted position, as shown in Fig. 1.

The rolls C have a feed-table, Z, on the front side, which is similar to the table M as to construction and power devices, but owing to the greater length of the rail bloom it is provided at the outer end with one or more friction rollers and intermediate platforms. The rear feeding table is merely the elongation of the transfer table or bed which carries the rail to the saws. In this table there are the friction rollers and adjacent driven rollers of the transfer table leading to the saws. The latter are driven by a shaft which is connected to the axles of the rollers by bevel gearing, and the shaft is driven by a belt leading from a suitable power-shaft. Journaled in the rear feeding table are two shafts which are driven by belts from the main rear power-shaft, and on their inner ends directly in front of the first pass of the finishing rolls C are tapered feed rollers having collars on their inner ends, to prevent the rail from being pushed clear over them. Extending from a point near the outer end of the table N to the adjacent side of the rear feeding table is a slideway or bar which aids in supporting the rail as it is transferred from the table N to the feed rollers. In transferring the rail bloom from the table N to these feed rollers, the end next to the rolls is supported and guided by the workman by means of a suspended hook lever—such as is commonly used for moving blooms in rolling mills—and the bloom is pushed over by the carrier on the track W, which is set in motion, as described, for that purpose, until it is placed on the rollers against their collars. The rollers then drive the bloom into the first pass of the rolls C. The driven rollers of the table Z return it to the rolls, which finally deliver it on the rear table, whence it is carried to the saws by rollers C.

The rolls may be provided with an inclined guide, similar to the guide on the rolls B, and for the same purpose, if desired. The pitmen H and their cranks are made of different lengths, so that when the tables D and E are in receiving positions they shall turn on their pivots and incline from the rolls A, so as to facilitate the delivery of the bloom. It is evident that one of the rising and falling tables (D and E) may be used with advantage without the other, in which case the bloom may be handled on the opposite side of the rolls in any other desired way; also that the table may be used for some kinds of work with but one driven feed roller, in which case the other rollers would not be geared thereto, but would turn by the friction of the bloom; also that the feed tables may have separate elevating devices; also the pivoted incline slideways may be used without feed tables; also that the rising and falling feed tables may be raised by the direct action of hydraulic or steam pistons and the tipping motion communicated to them therewith. The free ends of the slideways S project over the adjacent side of the table D, and in the absence of the raising mechanism, of which shaft R is the center, the slideways, arranged as shown, would rise and fall with the table D. They can therefore be used without other means than the table for raising and lowering them.

Such is substantially the construction of the present rail mill of the Edgar Thomson Works. It has made it possible to reduce the number of men required on the train to seven, and to roll a rail in 27 seconds.

Another fine iron bridge is to be built in Philadelphia at the Market street crossing of the Schuylkill River. Speaking of the cost of maintenance the *North American* says, quoting from a prominent engineer and bridge-builder: "The durability of an iron bridge depends upon the quality of the iron, the kind, and the care bestowed upon it by those who have it in charge. Nothing equals the truss for lightness, strength, successful resistance to strain and cheapness. A first-class iron bridge at Market street crossing can be kept good for 50 years at an expense not to exceed $1600 per year. This expense would keep the structure in first-class order, covering all repairs and painting annually. Attention has been directed to the Harrisburg bridge, which was built 82 years ago, and is still serviceable, because it has been strictly cared for. Upon inquiry we are informed that the cost of maintaining the iron bridge across the Schuylkill above Market, which is subjected to an enormous strain every hour, does not exceed $500 a year. Our information allows for rather more than thrice that sum yearly for keeping the proposed structure on Market street in the best order."

Indian Castings.

In a recent communication to the British Iron and Steel Institute Mr. C. Purdon Clarke, of the Indian Section of the South Kensington Museum, London, remarked:

The importation of partly-manufactured material is at present exercising considerable influence over many of the native arts of Oriental countries and India. The supply of machine-made thread has doubled the village handlooms in some districts of Madras, and gold thread from Germany has enabled the brocade weavers to compete with the imitation brocades sent in from Europe. In some handicrafts, however, the supply of European material has produced a contrary effect. Iron and steel, bar and rod, have displaced an ancient industry, and sheet copper and brass have robbed the founder of half his work. Formerly the only means of producing sheet metal was by hammering cast plates, an expensive method, only resorted to when thin flat coverings were required for wooden or other objects. For very large vessels, where weight was required to be kept down and strength maintained, hammered sheet was used; but generally the founder was employed, to save as much as possible the labor of forming the furnished castings which required but little beating out, trimming and brazing. In the case of a bowl, or flat jar with a narrow mouth, the founder would prepare a cast not unlike in shape and thickness that of an ordinary flower-pot saucer, from which, by constant hammering, the bulbous sides would be formed, projecting beyond the rim, which would remain of its first diameter and thickness. When finished such a vessel would be nearly double the size of the first cast, and a remarkable example of the native knowledge of the composition of bronzes and annealing processes. It is worthy of noting that the chief means of detecting modern from old Persian and Saracenic metal vessels is by examining the brazing joints, which in ancient vessels are rare. When not found, a close examination will show the vessel to be a thin casting, the ornamentation being by inlay or chasing and hammering, which, being done after the cast is made, gives the reverse side the appearance of chased sheet metal.

So far as I could ascertain, there are three methods of casting practiced in India. The first by molds in sand; the second, molds in clay not unlike plasterers' piece-molds; the third, clay molds formed on a wax model, the *cire perdu* of Europe. The first of these is well known in Europe, but the second is, I believe, now described for the first time. In preparing the mold, impressions of the various parts of the pattern are taken in clay, and these pieces when nearly dry are, after trimming, stuck neatly together, and kept in place by several layers of mud, in which some fiber is mixed. The mold when ready has but one vent, which, placed on the most convenient side, is carried up into a sort of bottle neck. If the object is small several molds are attached together, and the vents united by a single short neck of clay, to which a crucible, inclosed in an egg-shaped ball of clay, is attached. The size of this crucible depends upon the exact amount of metal required to fill the mold or molds; and this quantity being known by experience, the founder places it inside before closing up. No provision is made for the escape of air from the mold when the metal is poured in. The mold and crucible (now in one piece) are allowed to dry; and after several coats of clay, tempered with fiber, have also been well baked on by the sun, the furnace is prepared. This is simply a circular chamber about 2 feet 6 inches in diameter, 2 feet in hight, with a perforated hearth and no chimney. Half filled with charcoal, a good heat is obtained by the use of several sheepskin bellows from beneath. When ready, as many molds as the furnace will hold are placed in it, the crucible end of each being embedded in the fire. A cover is placed over, and the fire kept up until, upon examination, the molds are found to be red hot. They are then taken, one at a time, and replaced in a reverse position, the crucibles being now above. The metal flows down into a red-hot mold, and penetrates the finest portions of the surface without suffering from air or chilling. The fire is allowed to gradually cool, and when the objects are broken out of their clay covering, the metal is soft and malleable.

The third manner of casting—that by the use of a wax pattern which is destroyed in the molding—is well known, but in one particular case the process has been carried further than would be at first believed, and of this I will now attempt a description. The object produced is an anklet, a flexible ring about 4 inches in diameter, made from an endless curb chain. Such curb-chain trinkets are common in India, and are generally made from thick silver-wire rings interlinked and soldered one by one. In this example the anklet is of bronze, and consists of a complicated chain of 43 detailed links, the whole being cast by a single operation. The first part of the process is the preparation of a pattern in wax, a delicate work, each link having to pass through four others, and to bear three small knobs or rosettes. These are in two instances but ornaments; the third, however, serves as a channel for the metal to enter each ring. Then commences the most difficult part of the work, each ring having to be slightly separated, and this is effected by painting in a thin coat of fine clay until there is sufficient to form a partition. Other coats of clay are added until a thickness of about ½ inch is attained, when a groove is cut round the upper side of the ring, and deepened until the row of knobs is bared. The wax is then melted out, and the mold attached to a crucible as before described. When cast, and the mold broken away, the chain comes out inflexible, being attached to a rod which runs round where the groove was cut. This is broken off and the chain is complete.

Commenting on that volume of the report of the Commission on Depression of Trade which contains the replies of the English consuls, the *British Trade Journal* says:

"No one can read those replies without being struck by the unanimity with which attention is called to two matters in which British traders are being outstripped by Continental and American competitors, and wherein there is necessity for greater enterprise and attention. The first of these points is the backwardness, the unwillingness, amounting almost to stupidity, of the British trader in adapting his goods and his mode of doing business to the wants and customs of the people with whom he desires to trade. The second point is the scarcity of British commercial travelers in districts where representatives of foreign houses cover the ground regularly and frequently. When Great Britain was almost without a serious competitor in the world's markets her traders could afford to adhere very closely to their own pet ways of doing business, and trust very largely to orders being sent to them, because they knew that buyers were almost compelled either to make their purchases here or go without the goods. But now that the peoples of other lands have entered the field, and are struggling, by no means altogether unsuccessfully, for a share of the orders that are being given out, these old-fashioned methods will not do. Buyers must be seen in their own countries, goods must be pushed, and an intimate, practical and constant knowledge of the requirements and wishes of the people must be secured. Our rivals are doing it, and if we do not we shall suffer. Indeed we are already suffering, because we do not devote sufficient attention to these matters now."

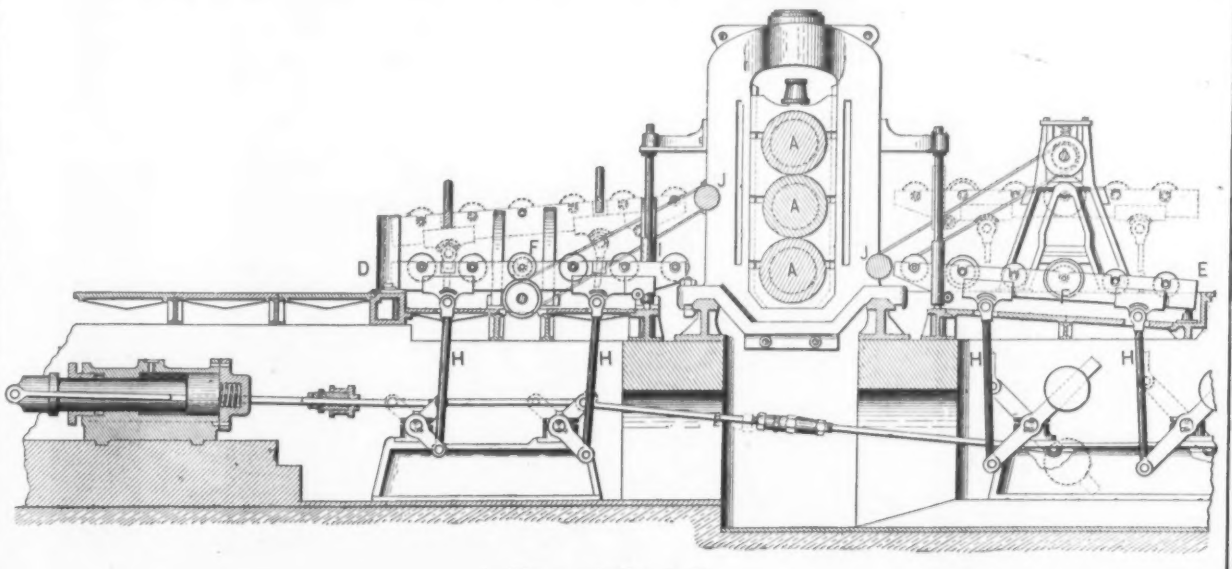


Fig. 2.—Section I, II.

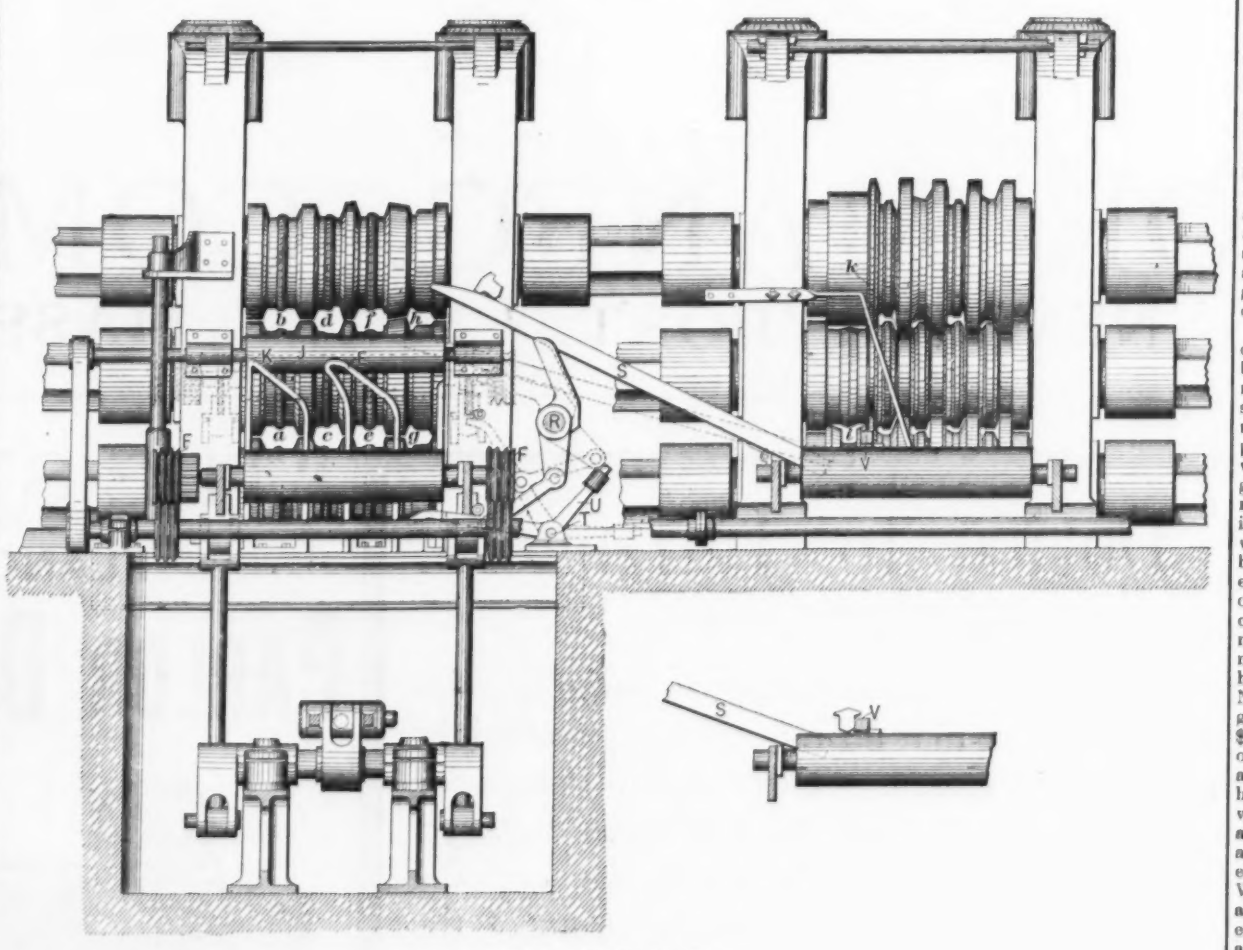


Fig. 3.—Section III, IV.

THE EDGAR THOMSON RAIL MILL, NEAR PITTSBURGH.

Making Enameled Brick.

The obvious suitableness of enameled brick for use in many places exposed to moisture, or where contaminating vapors might be present in the air, has doubtless suggested itself frequently to those who have noticed its growing introduction within a very few years past; the great superiority of such bricks to painted brickwork in kitchens, laundries, courts and cellar areaways does not admit of question, while they may also be used to advantage in many places for wainscoting in halls, as well as for ornamental fronts and trimmings. Such brick must not, however, be confounded with a cheap glazed one, which has been sometimes used, only to open up like a chestnut burr after the first winter's frost. This description is, of course, cheaper than a good enameled brick, but the materials and workmanship that are necessary to make the latter are absolute requisites if one is looking for lasting qualities. But on account of the high cost and the difficulty of making a good quality of enameled brick, enough of these inferior glazed ones have been used to impede the more rapid introduction of the best quality, and there are now but three or four establishments in the country which make them.

It was not until after many unsuccessful experiments that good enameled brick were produced in this country, the recipes of English and German enamelers not working well with our clays; and it is always to be borne in mind that the various proportions of the different ingredients have to be slightly changed according to the amount of oxide of iron, lime, &c., that the clay may have In one of the enameling compounds used for a building brick the following proportions are used: Fluorspar, 150 parts; paris white, 60 parts; lime, 50 parts; oxide of tin, 50 parts; kaolin, 50 parts. These ingredients are pulverized and triturated to an impalpable powder, reducing the whole to a homogeneous mass, which is calcined in a crucible. After cooling it is again reduced to a powder, water added, and the whole triturated to form an enameling compound of about the consistency of cream, in which is to be dipped that portion of the brick to be enameled, the latter to be then subjected to a sufficient temperature to fuse the enamel on the surface, this being done in seggars, or fire-clay cases holding four or five bricks each. The enamel is usually applied only to the one face or head which will be exposed after laying in the wall, except with those intended to be used for corners and reveals or windows and door jambs, which have one face and head treated, and are termed "rights" and "lefts" when so molded that they cannot be used for any corner. A black surface is made by adding to the above ingredients black oxide of cobalt, black oxide of manganese, and umber, previous to pulverizing and calcining; blue, by adding black oxide of cobalt; green, by adding suboxide of copper; red, by adding suboxide of copper and red oxide of iron; and almost any desired shade or tint may be given by the use of varying proportions of different ingredients.

These enameling compounds may be used on the surface of ordinary red front brick, but pressed brick are better, that the surface may be as smooth as possible, while they should be free from sand, or the enamel will not adhere. The amount of capital and the plant necessary to engage in a moderate way in the business of enameling brick, as given by a contributor to the *Clay Worker* recently, are as follows: "In the first place, it is necessary to have a kiln adapted to this work It is better to have a muffle kiln, but in the absence of this a kiln can be erected with a capacity of from 6000 to 10,000 brick for about $600 to $800. Then come next in order the seggars; these are made to hold five bricks each. They are made of fire-clay, uniform in size, and burned hard, costing at the factory 16 cents each. Next we have the mill or pulverizer to grind the enamel in. This will not exceed $20. Indeed, any one can make a first-class one that will not exceed half that amount, and be equally as good. Next in order we have the tubs, buckets and cups. These will cost for an establishment of this capacity about $50. Here we have an establishment all complete, except the building and enameler to do the work, for less than $2500. With a kiln of this capacity and the assistance of a man who understands burning, an enameler and two boys can produce on an average 40,000 enameled brick per month."

The cost of enameling as figured by this writer is as low as $12 to $15 per 1000, which certainly leaves a large margin for profit at to day's prices, but this is counting on the work being that of a good enameler, and such men are said to be very scarce.

A new building material called "asbestine" is to be put on the British market, for which remarkable fire-resisting qualities are claimed, as well as superior hardness and adhesiveness and applicability at all temperatures. It is proposed to make it a substitute for plaster as at present mixed, because it requires no hair, and it is represented not to crack under the influence of fire, as ordinary plaster does, and will therefore prove a check to the spread of flames. Another advantage claimed is in dispensing with wooden laths, as the new material will be applied to thin sheets of corrugated iron, which alone will afford considerable protection. Asbestine is also represented to be of superior value for purposes where cement and mortar are ordinarily used.

It is officially stated that although M. Rousseau, who visited the Isthmus of Panama in the interest of the French Government, admits that the possibility of the success of the canal is dependent upon contingencies of a serious nature, the Technical Commission has expressed the conviction that the obstacles to the construction of the canal can be overcome. The Panama Canal Co. will probably issue a loan of 600,000,000 francs to complete the canal and avoid a further loan.

The Odessa *Journal* states that Herr Krupp is preparing to establish a foundry for the manufacture of cannon at Nikolaief, the Russian naval station at the junction of the Ingul and Bug rivers.

MECHANICAL.

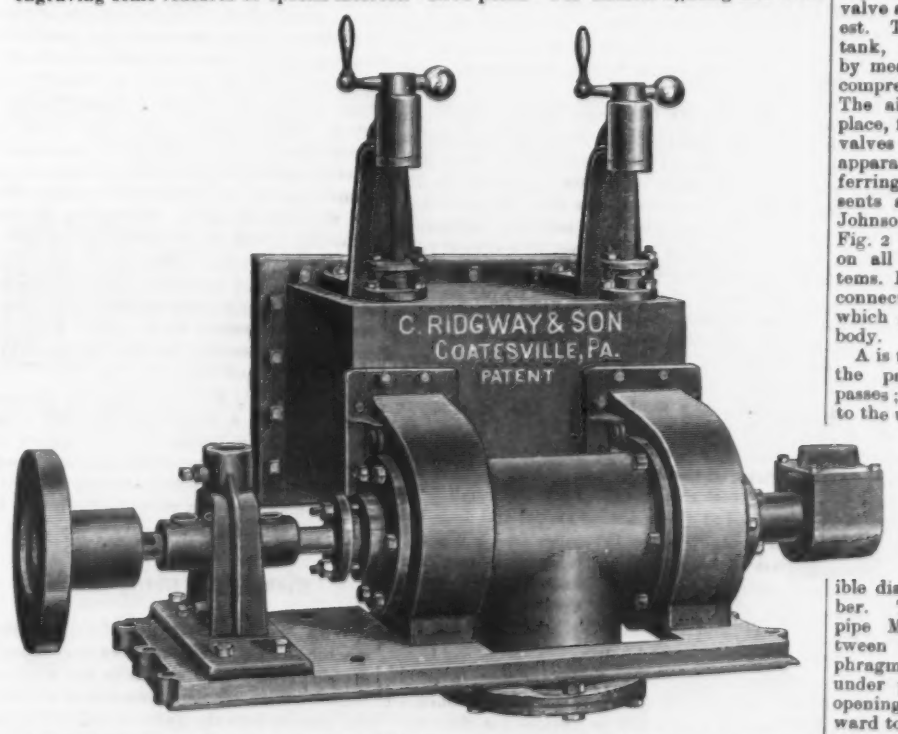
Testing Dynamo Machines.

It is very easy to determine the electrical efficiency of a dynamo. We have only to ascertain what is the electrical energy given out and what is the electrical energy developed in the armature, and to take the ratio between the two. All this is extremely easy, and requires no other apparatus than a Wheatstone bridge to measure the resistance of the different parts of the dynamo, and the usual current and potential indicators. The resistances once ascertained the other measurements can be taken without in any way interfering with the working of the dynamo; and it is therefore but natural that the makers of these machines often make use of the term "electrical efficiency." But to the practical engineer the term has no meaning. He wants to know how much power he must provide to produce a given electrical output, inclusive of all losses, and he can only ascertain the power beforehand if he knows the actual commercial efficiency of the dynamo he is going to employ. The usual way of measuring the commercial efficiency of a dynamo machine is by employing some kind of transmission dynamometer placed between the prime mover and the dynamo, and taking simultaneous readings of the energy transmitted and the electrical energy obtained. Now, every engineer knows that measurements of that kind are difficult to make, and require costly apparatus, especially if the power to be transmitted is considerable. Only the very best and most expensive forms of transmission dynanometer—such as Tatham's or Brackett's—give fairly accurate results, and a cheaper class of instrument would be perfectly useless, as its own error would probably exceed the difference between electrical and commercial efficiency which we wish to ascertain. It must be remembered that the commercial efficiency of the modern dynamo is far greater than that of any other machine intended to convert energy from one form into another, and that the difference between an excellent dynamo and a fairly good one is reckoned by but a few per cent. in the efficiency. Hence a transmission dynanometer which may have an error of a few per cent. would be useless for our purpose, besides being, on account of its price, beyond the reach of most private individuals.

The difficulties which stood in the way of accurately determining the commercial efficiency of dynamo machines have recently been overcome in a most ingenious manner by a method devised by Dr. John Hopkinson. This method was first described by its inventor in the discussion following the paper on "Modern Continuous Current Dynamo Machines and their Engines," read by the author in November last at the Institution of Civil Engineers. It consists, broadly speaking, in measuring not the whole of the power supplied to a dynamo, but the power wasted by two similar machines which are mechanically and electrically coupled, the one acting as a generator and the other as a motor. Dr. Hokinson said: "Supposing 100 to be applied mechanically to the first machine, a power of 90 might be delivered by that machine to the second machine. Of that 90, 80 would in the second machine be converted into mechanical power, which mechanical power would be transmitted by the shaft to drive the first machine. There would remain then to be supplied only 20 for driving the whole combination. The quantities to be measured are then 20 and 90. Suppose that instead of measuring quite accurately the measurements were 91 and 19.8. That 19 8 waste is divided between two—9.9 for each. Consequently the first machine, apparently with an expenditure of 100.9, gives 91, so that although errors were made of 1 per cent. in each determination in the final result of efficiency there is only an error of 0.2 per cent."

Double Horizontal Turbine.

Those who are acquainted with turbine water-wheels will find in the accompanying engraving some features of special interest.



DOUBLE HORIZONTAL TURBINE, BUILT BY C. RIDGWAY & SON, COATESVILLE, PA.

The wheel there shown is known as the Double Horizontal Perfection, and has just been put on the market by Messrs. Ridgway & Son, of Coatesville, Pa., the well-known water-wheel builders. The cut is made from a photograph of a machine just furnished by this firm to the Du Ponts, the powder manufacturers, and is intended to couple directly to the machine to be driven, all transmitting machinery being entirely done away with. This style of wheel is guaranteed by its builders to yield a useful effect of 80 per cent. at all stages of the water used from one-half up to the full quantity, which they state they can easily do because the wheel really gives 85 per cent on all heads over 20 feet.

The wheel is intended particularly for high heads and heavy pressures, and its striking simplicity makes it pre-eminently adapted for such situations. The gates, one for each wheel, are simply flat plates sliding over annular openings, and with the wheels proper or runners are the only parts out of sight under water. There is not a single bolt or screw-thread that cannot be seen or reached even when the wheels are in operation. When the double horizontal wheel is used for sawmills or other work that requires frequent manipulation of the gate, a valve-gate on the principal of the old-fashioned stove-pipe damper is put in the draft tube, and, being perfectly balanced, may be opened and closed by a cord led to any desired point. For electric lighting and other places requiring a governor a very simple device of this kind can be attached to this valve-gate.

The Johnson Electric Valve Service.

We take pleasure in presenting in the accompanying engravings an electric—or, more properly, an electro-pneumatic—valve, which, though on the market in its latest improved form only a short time, has already yielded excellent results and secured much favor. It is made by the Johnson Electric Service Co., of Milwaukee, Wis., for whom the National Electric Service Co., of 686 Broadway, New York, are the agents.

Before describing the valve in detail we would briefly remark that if an attempt is made to close or open a valve, as, for example, on a steam-pipe, by the direct agency of electricity, it will be found that a very large battery is required to do the work—so large a battery, in fact, that it would be entirely impracticable. In order to get the required power for operating the valves, therefore, Prof. W. S. Johnson, the inventor of the device which we illustrate, uses compressed air, which operated directly upon a piston or its equivalent, and through it performs the desired work. In this case the electricity has only the simple duty of admitting or releasing the compressed air from a supply chamber. A very feeble current of electricity serves for this purpose, and, what is more, the same quantity of electricity will operate the largest valve as easily as it will operate the smallest. The compressed air is stored in a small tank, which is filled as occasion requires by means of a small air pump. The air is compressed automatically by water pressure. The air tank is kept in some convenient place, from which small pipes lead to the valves to be operated. The working of the apparatus will be readily understood by referring to our annexed cuts. Fig. 1 represents a general view of what Professor Johnson calls the diaphragm-valve, while Fig. 2 shows a section. This valve is used on all pipes on steam, water or brine systems. It consists of an ordinary valve body, connected with an expansible diaphragm, which serves to close the valve in the valve body.

A is the valve body; B the valve disk; C the packing-box through which the stem passes; H is a saucer-shaped piece fastened to the upper end of the stem D. The valve is held open by the steel spring *b*, which presses upward on the saucer H. Above this saucer H is the umbrella-shaped piece J, held by the standards *a a*. Upon the under side of the piece J, and fastened firmly to its edges to produce an air-tight joint, is the flexible diaphragm K, made of cloth and rubber. There is an opening through the pipe M into the chamber formed between the metal piece J and the diaphragm K. It is easily seen that if air, under pressure, is admitted through the opening M, the valve will be pushed downward to its seat. When the air is allowed to escape from above K, the spring *b* will open the valve B to its full extent To show with what force the valve is seated, let us suppose that 60 pounds of steam are being carried, and that B is an inch valve. In this case the area of B is 0.78 inch, and the steam pressure upon it is 47 pounds; the area of the diaphragm K, as it is made for 1-inch valves, is 9 square inches. If the air pressure is 10 pounds per square inch, the valve B will be seated with a force of 90 pounds, which is 43 pounds in excess of the steam pressure. If we allow 10 pounds as a sufficient excess of pressure of air, it will be seen that a 10-pound air pressure will operate the valve B against 100 pounds of steam. As both the area of the diahpragm K and the air pressure may be increased at pleasure, it is evident that the valve B may be operated against any pressure of steam. For low-pressure steam heating, where no more than 10 pounds of steam are carried, as little as 1½ pounds of air pressure will operate the valve perfectly.

We will now proceed to explain how the compressed air is admitted to the diaphragm K. The pipe M (Fig. 2) leads to the electro-pneumatic valve, shown in Fig. 3, and is attached to the nipple marked B. This valve is fastened to the wall or floor, usually near the diaphragm-valve. The nipple A is connected by a short tube to the pipe which leads to the reservoir of compressed air. The same pipe leading from the reservoir runs to all the electro-pneumatic valves. Whenever it is desired to operate a valve a T is placed in the pipe and the branch pipe is attached. One of the binding posts is shown at the left. When the electro-pneumatic valve operates the compressed air passes freely through it from the nipple A to the nipple B on the opposite side, and on to the diaphragm-valve. When the electric circuit is again made the outlet to the compressed-air reservoir is closed and the outlet C is opened, permitting the escape of the compressed air in the diaphragm chamber (Fig. 2), and enabling the valve B to open. The electro-pneumatic valve proper, working in the case shown in Fig. 3, is, we need scarcely explain, operated by the four electro-magnets, and oscillates in a horizontal plane. A common telephone battery is used with the valve. This battery requires little attention, and is made up of from three to six cells, according to the number of valves to be operated. It will be understood that the valve can be worked by means of push-buttons from any point desired. Fig. 4 shows a diaphragm globe valve to be introduced in steam and water pipe connections, &c. Where the electric valve is used to control temperature an adjustable thermostat is placed in the circuit.

A small air pump attached to the water supply of the building in which the valves are used keeps up a supply of compressed air without any attention whatever. Where there is no water supply a hand pump may be used. The only pumping necessary is to keep the pressure up to about 5 pounds. This requires very little time, five minutes work per week being stated to be sufficient. We would add that the compressed-air supply to the diaphragm-valve may be throttled, so as to effect a comparatively slow closing or opening.

We had occasion a few days ago to examine the devices at the office of the National Electric Service Co., in this city. So far as we could find, they worked perfectly and are well entitled to favorable consideration. The system may be made very extensive in this application, and embraces features which will readily commend themselves to those interested in appliances of this kind.

Fig. 1.—*General View of Diaphragm Valve.*

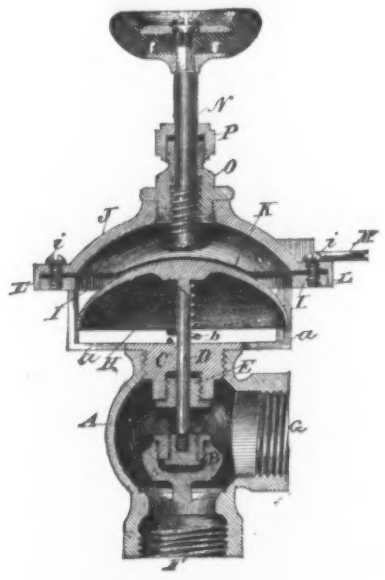


Fig. 2.—*Section of Valve.*

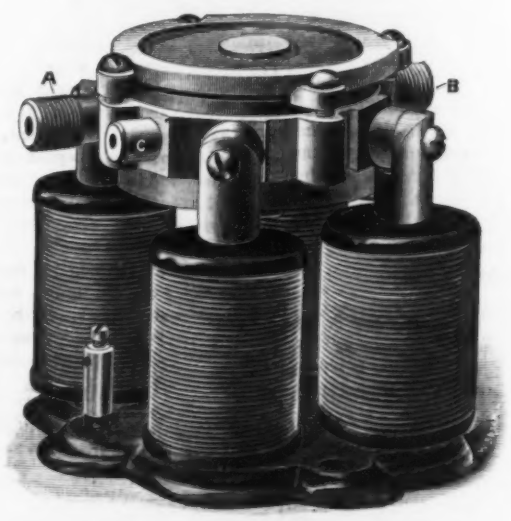


Fig. 3 —*General View of Electro-Pneumatic Valve.*

Fig. 4.—*Diaphragm Globe Valve.*

THE JOHNSON ELECTRIC VALVE, MADE BY THE JOHNSON ELECTRIC SERVICE CO., MILWAUKEE, WIS.

Transmission of Power by Belting.

Mr. Wilfred Lewis, in his paper on "Experiments on the Transmission of Power by Belting," presented at the last meeting of the American Society of Mechanical Engineers, reached, among others, the following conclusions: That the coefficient of friction may vary under practical working conditions from 25 to 100 per cent.; that its value depends upon the nature and condition of the leather, the velocity of sliding, temperature and pressure; that an excessive amount of slip has a tendency to become greater and greater, until the belt finally leaves the pulley; that a belt will seldom remain upon a pulley when the slip exceeds 20 per cent.; that excessive slipping dries out the leather and leads toward the condition of minimum adhesion; that raw hide has a greater adhesion than tanned leather, giving a coefficient of 100 per cent. at the moderate slip of 5 feet per minute; that a velocity of sliding equal to 0.01 of the belt speed is not excessive; that the coefficients in general use are rather below the average results obtained; that the sum of the tensions is not constant, but increases with the load to the maximum extent of about 33 per cent. with vertical belts and indefinitely with horizontal belts: that, as the economy of belt transmission depends principally upon journal friction and slip, it is important to make the belt speed as high as possible within the limits of 5000 or 6000 feet per minute; that quarter twist belts should be avoided; that it is preferable in all cases, from considerations of economy in wear on belt and power consumed, to use an intermediate guide pulley, so placed that the belt may run in either direction, and that the introduction of guide and carrying pulleys adds to the internal resistances an amount proportional to the friction of their journals.

Small Water Motors.

Speaking of the efficiency of small water motors the *American Engineer* says:

Some of these motors take the form of water engines, especially when adapted to blowing organs or producing a reciprocating motion. Others are models of turbine-wheels, while many of these motors are simple forms of impact and reaction wheels, wherein the power is derived from the direct impinging of a small jet of water at a high velocity against a series of cupped floats or plates attached to the arms of a wheel inclosed in a case, the waste water flowing off to the sewer after having spent its force in causing the wheel to revolve. Such a motor is very simple in construction, and consists of a wheel with the series of floats attached on its periphery, inclosed in a chamber to prevent the dashing of the water, and, as this revolves in the case without contact, the only parts liable to wear are the two journals of the supporting shaft, which, projecting through the sides of the chamber, are provided with oil-boxes and are easily cared for. These ends of the shaft are fitted with pulleys, from which motion is communicated to a line shaft by belting or cord. A very pretty application shown in a grocer's window was one of these motors. The shaft on one side was provided with a pulley, from which was driven a set of coffee-grinders, while from a crank attached to the opposite end a connecting-rod worked a machine for slicing smoked or dried beef.

The motors are very handy. They are always ready when their services are required for either long or short duty, and they never get tired. A moment given to open the water-valve and they are in motion. Simply closing the same valve and they are motionless, and while at rest they are no expense. In this respect they have the advantage of both steam and hot-air engines, which require the continual keeping up of the steam pressure in the boiler, or of heat in the furnace, and also of gas motors, which are much more complicated pieces of mechanism and require better mechanical skill and ability in their attention and care. In fact, they are, because of their extreme simplicity and non-liability to get out of order and wear out, peculiarly adapted to fill the demand for help where a constant water pressure and supply can be obtained.

In regard to the expense of operating such motors, that of course depends upon the total hours per day they are run and the load they are called upon to carry. In their proportion of parts the nozzle from which the water issues for discharge against the floats will range from 1/8 to 1/4 inch diameter; the size will depend upon the working head or water pressure in connection with the amount of power required. The greater the pressure the smaller the nozzle and less water required to develop the power. Take, for instance, a motor having a nozzle of $\frac{3}{16}$ inch diameter, with a working head of 60 feet. The maximum theoretical discharge from an orifice of $\frac{3}{16}$ inch diameter, under a head of 60 feet would equal 44.68 pounds of water with a velocity of 37.29 feet per minute. Allowing for the friction of vent the actual effective discharge would be reduced to, say, 32 pounds of water delivered per minute; 32 pounds × 37.29 feet per minute = $\frac{119.328}{33.000} = 3\frac{8}{10}$ horse-power; deducting from this 40 per cent. for loss of efficiency, and it leaves, say, 2 horse-power as the maximum practical effect from the use of 32 pounds of water per minute, or $\frac{32}{2} = 16$ pounds of water × 60 = 960 pounds per hour; 960 × 10 hours = $\frac{9600}{625} = 153\frac{8}{10}$ cubic feet per day; $153\frac{8}{10} \times 300$ working days = 46,080 cubic feet per year; 46,080 cubic feet at 2 mills per cubic foot will amount to $92.16 per year for the water to produce an average of 1 horse-power per hour. That would be for constant power for 10 working hours and 300 working days. In case the motor was at work only part of the time, then the expense would be only in proportion to the hours run, while if the pressure was double and the cost per cubic foot remained the same, then the expense would be less, and so on.

Mr. Henry M. Meyers, of Beaver Falls, Pa., has been granted a patent, dated April 27th, 1886, for a method of manufacturing shovels. He rolls down the billet, cuts blanks from the bars thus rolled, splits the tang of the blank and forms the socket for the handle at the same operation, breaks down and reduces the blank, and finally points it.

The Iron Age

AND METALLURGICAL REVIEW.

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Labor and Trade.

There seems to be a general feeling in trade circles that unless something now unforeseen shall happen, there will be a gradual and sustained improvement in business until the end of the year, and that next year will be one of general prosperity for all departments of productive and distributive industry. Of course it is in the power of organized labor to blight this fair promise and to maintain for an indefinite period the uncertainty and distrust which always lead to stagnation and depression, even when the general condition of the country is such as to favor prosperity. Experience has shown that the country is never prosperous when the wheels of industry are blocked. It is then and only then that the country suffers from what is called overproduction. The true remedy for this condition of congestion is found in increased production. It is when the labor of the country is fully employed, and the wage-earning classes are consuming freely, that stocks quickly disappear and manufacturers find it difficult to keep up with their orders. This may seem paradoxical, but it is not. The wage-earning classes are always the largest consumers of all forms of staple commodities. As compared with farmers they are very liberal, and even reckless consumers. A single manufacturing town will, under normal conditions, consume a much greater variety and value of manufactured products of all kinds than are required to meet the requirements of a country containing a large population depending upon agriculture. Wage-earners spend their money freely, and live as well as their means permit; farmers are, as the rule, close, careful and economical buyers. Statisticians properly attach great significance to the crop prospects and the condition of the farming communities; but the immediate future of trade depends on the condition of the wage-earning classes and the extent to which the labor of the country is employed. It involves no contradiction, therefore, to say that the remedy for the state of congestion which we call overproduction is found in increased production. It is impossible to fill a tank by pumping into it when the pumps are supplied by suction-pipes connecting with it; but if the outlets are closed an invisible stream will in time overflow it. If organized labor will refrain from stopping production we may confidently predict a more than proportionate increase of consumption.

The trade unions hold the key to the situation. This is not because of numerical strength, for they include only a small part of the labor of the country. It is not because of superior intelligence, for the more intelligent workingmen are not found among the active partisans of the unions, if in the membership at all. It is not because the organizations control large resources, for their treasuries are usually in a rather depleted condition. It is because they are in a position to attract attention and create a feeling of uncertainty which destroys confidence. They have a vast power for demoralizing business and making capital afraid of manufacturing investments. They have, on the other hand, very little power for good, as their energies are seldom wisely directed. Any conspicuous activity on their part will, in the light of past experience, give rise to grave apprehensions, whatever its immediate and ostensible object. If, therefore, the working classes desire their own prosperity, they would do well to discourage, as far as possible, any present activity on the part of those who represent the labor organizations. The country needs time to recover from the shock of the great and profitless struggle through which we have so lately passed. Meanwhile employers would do well to consider the advantages to result to them from the establishment of relations better calculated than those which now exist to command the confidence of labor and avert the differences which so frequently arise. Shop arbitration seems to us the best thing which employers can offer labor. It provides the means of reaching an agreement on almost all subjects likely to be in dispute, and of correcting the mutual misunderstandings which are the principal cause of labor troubles. By this means the workman will be taught that very few questions arising in the shop need be carried as grievances to the union, and that the committee is not the best agency for correcting real or fancied wrongs. There is no reason why nine-tenths of the questions now discussed in hostile spirit in the unions should not be settled in an amicable and friendly way by mutual concessions, as are those arising in the well-ordered family. This will be impossible, however, until each mill and factory and workshop has its own board of arbitration, so constituted as to fairly represent both sides and command the respect and confidence of both, but without controlling the action of either. When men want to quarrel and fight, no system of adjusting their differences can avert trouble. Sometimes strikes are inevitable, but we assume that ordinarily employers and workmen do not want to quarrel, and would not if they fully understood the questions in dispute between them. We regard shop arbitration as the first and most natural step in the direction of a better understanding between those who pay wages and those who earn them, and thus, while it is not a panacea for all the evils of our industrial system, it will be fruitful of good results to all concerned, and do more than anything else to realize the promise of a large and more general prosperity.

The Pittsburgh Settlement of Wages in Western Nail Works.

As we noted last week, a meeting of the committee representing the nail manufacturers of the West and the nailers west of the mountains was held at the Iron Association rooms at Pittsburgh, on the 23d ult., for the purpose of settling the wage scale for the year commencing July 1. At this meeting the nailers presented the 18-cent or Mingo scale, which the manufacturers refused to sign, contending that it was too high. The manufacturers then proposed a 17-cent scale as a compromise. Upon the request of the nailers, who desired time for further consideration, the meeting adjourned till Friday, the 25th. At this meeting the two scales mentioned above were again presented, and arguments made by each side. The manufacturers were firm, while the nailers' representatives showed a willingness to make concessions. After a discussion lasting some hours the following scale was decided upon. We have added the Mingo scale and the figures demanded before the strike by manufacturers and nailers respectively:

Card rate.	Scale accepted.	Mingo compromise.	Manufacturers.	Nailers.
$2.00	17	18	15	..
2.25	18	19	17	21
2.50	19	20	18	22
2.75	21	21	19	23
3.00	22	22	20	24
3.25	23	..	..	..
3.50	24	..	..	..
3.75	25	..	..	..

Ten per cent. off when self-feeders are used.

The scale as signed does not affect the factories which are working under the Mingo scale. The latter expires in February next, and what action will be taken by the works now running remains to be seen. It is likely that they will adopt the new scale, since the agreement was signed with a body not now in existence. There are 800 machines being operated under the Mingo compromise, which it will be observed is higher than the scale finally agreed upon. Then there are about 1200 machines which have been run by feeders at the manufacturers' old terms for quite some time. The majority of these works are paying their men less than the final scale. It remains to be seen whether the Amalgamated Association will try to coerce these mills into acceptance of the higher terms by ordering out the puddlers and rolling-mill hands acting under their orders in some of the mills affected, and thus restore the striking nailers to the positions filled by their former helpers, the feeders. It may be questioned whether they will endeavor to exercise what power they possess in behalf of recently readmitted members who have been disloyal in the recent past.

So far as those mills which have been idle all along are concerned, the Pittsburgh agreement practically ends the long strike of the nailers, lasting, as it did, since the 1st of June, 1885. This protracted struggle has taught severe lessons. It has proven that there was little foundation for the claim of the nailers that it required years of training to acquire the skill of which they insisted upon possessing a monopoly. Mill after mill has gone to work with feeders, and, though the product was not at first satisfactory, they have acquired the necessary skill. Even those feeders who resisted the temptation of occupying the places of their better-paid associates are showing that they are not blind to the teachings of the strike, some of them showing a disposition to demand a different adjustment of the proportions paid to them out of the total wages for cutting.

The effect of the Pittburgh settlement upon the nail market, so far as the immediate future is concerned, is not likely to be very great. As we have repeatedly pointed out, prices throughout the country are at a point where the majority of the nail works are not getting a new dollar for an old one, while some must be running at a loss, merely because their financial position is such that they cannot afford to stop. There is very little temptation, therefore, to start up idle nail mills at the present time, though it is understood that a number of them will start at an early date. Those who remain idle, however, will be placed in the position where even the slightest indications of a rise will make them active competitors, and to that extent the Pittsburgh agreement will be a present and prospective burden for the market.

The Position of Tin.

Since we last noticed tin editorially it has passed through extreme fluctuations, first advancing £4, then again declining as much, but finally recovering half of it. Statistically tin stood on May 31 as follows:

	1886. Tons.	1885. Tons.
Straits and Australian, spot	5,461	5,382
Straits and Australian, landing	461	706
Straits, afloat	926	1,430
Australian, afloat	779	900
Banca, on warrants	900	1,905
Billiton, spot	539	1,228
Billiton, afloat	737	1,059
Stocks in America, including quantity afloat	1,960	880
Total	11,853	13,409
Prices of Straits and Australian	£97. 15/	£90. 10/
Deliveries during month in London	1,388	1,405
Deliveries during month in Holland	560	598
Total	1,948	2,003
Banca in Trading Co.'s hands and afloat	2 693	

In their circular of June 8 Messrs. Vivian, Younger & Bond, of London, remarked: "Consumers of tin appear at last to begin to take a more serious view of the position into which this article is drifting, and we have had during the past month a steady, though not very important, advance in price. The diminution in supplies has a tendency to become more pronounced, and the figures we give below are the most interesting we have had for very many years, and we repeat that, taken in conjunction with the known increase in consumption, the quantity of tin available for the world's supply is altogether inadequate. We have no doubt the course of prices has been materially influenced by the rumors from time to time of efforts that are made to increase supplies; but up to the present there is no reliable information from any scource that any new tin is coming into the market or likely to come for a very considerable time, and when it is considered that in 1880 the visible supply of tin, including America, was 24,185 tons, whereas it is to-day 14,523 tons, and the manufacture of tin plates was from 30 per cent. to 40 per cent. less than it is now, it is obvious, we think, that unless there is 'a snake in the grass' somewhere, which the market is not at all aware of, we shall see the diminution in figures assume much more serious dimensions. Manufacturers would therefore do well to make their calculations on the possibility of very much higher prices." Messrs. De Monchy & Havelaar, Rotterdam, in their monthly circular, dated May 31, wrote: "The production of Billiton for 1885-86 (from 1st May, 1885, to 30th April, 1886) amounts to 81,052 piculs, against 61,357 piculs in 1884-85, 70,974 piculs in 1883-84, 70,081 piculs in 1882-83, 66,331 piculs in 1881-82, 78,928 piculs in 1880-81. The average production during the last 10 years is about 72,800 piculs. A public sale of about 11,000 piculs will be held at Batavia on the 30th June next."

The advance in June was at first gradual, and considered sound, the metal evidently improving on its own merits and without the assistance of rampant speculation. After the latter had begun to overtly share in the movement, a good many London operators preferred to realize profits, and the sudden drop took place. Still the partial recovery was as rapid, because consumers then deemed it prudent to secure some supply in view of the real scarcity of the metal, which from the Straits has been diverted to China and India on an unusual scale latterly, while production is nowhere on the increase, and therefore unable to cope with the steady and growing consumptive demand. The trade seems to have a good opinion of the future course of prices, and this lends strength to the tin market, even more so than speculative manipulation in London and here. Tin has thus shaped its course, so to say, independently of the general merchandise market, which has remained dull. A favorable change in general trade, which cannot be long delayed, would strengthen the position of tin still further.

Beneficial Effects of Protection in Germany.

One part of an inquiry annually undertaken by the German Association of Iron and Steel Manufacturers has been published recently, with the object of furnishing convincing proof that the moderate duties in force since 1879 in Germany have had a beneficial effect both on labor and capital interested in the iron and machinery trades. The figures now issued cover the operations for the last fiscal year of 103 stock companies which were in existence in 1879. Their record is as follows:

	1885. Marks.	1879. Marks.
Capital	364,125,084	374,229,841
Total profits	21,270,942	10,275,258
Total losses	1,969,857	1,682,254
Balance profits	19,301,085	8,592,304
Per cent. profits	5.30	2.29

These figures appear to be more complete than those put forward a year since, when the returns related only to 89 companies. A comparison with the latter shows, too, the limitations, so far as accuracy is concerned, of investigations of this character. The 89 works showed a profit in 1879 of 2.57 per cent., while a larger number in the same year, according to the last report, exhibits only 2.29 per cent. The data must therefore be accepted only with some allowance, and it may be questioned whether it would not be found that those who failed to report are the very ones which would draw down the average.

These points should be considered, too, in dealing with the figures relating to iron and steel works included in the general summary given above. The returns for 1885 are as follows, taking in 50 companies:

	1885. Marks.	1879. Marks.
Capital	254,801,722	257,466,022
Total profits	10,711,537	5,802,818
Total losses	1,359,638	1,133,131
Balance profits	9,351,999	4,662,687
Per cent. profits	3.67	1.81

Here, again, we meet with the same discrepancy. In 1884 the association reported a balance of profits for 45 works in 1879 at the rate of 2.09 per cent. on the capital, making the figure for 1884 5.41 per cent. This year 50 companies report 1 81 per cent. for 1879 and 3.67 per cent. for 1885.

We may quote, too, the figures for the companies whose business it is to manufacture machinery. Grouping the data of the last returns of 53 concerns we have:

	1885. Marks.	1879. Marks.
Capital	109,323,302	116,759,819
Total profits	10,579,305	4,472,440
Total losses	630,219	549,823
Surplus profits	9,949,086	3,922,617
Surplus profits, per cent.	9.10	3.36

In 1884 the reports of 41 machine shops and foundries showed the corresponding percentages to be 11.38 and 5.41. It is evident that the greater number of data has considerably lowered what appeared to be very high profits from a Continental point of view.

We are far from any desire to doubt in any way the perfect honesty of the statistics submitted. We have alluded to the differences between the data submitted in the two years merely to be able to insist that, being incomplete, they can only serve as a general guide. It will not do to draw from them a general conclusion that the German iron works made a profit of 3 67 per cent. on their capital in 1885. The general average may be higher or it may be lower, the probabilities being in favor of the latter The only deduction which it is fair to make is that, in a general way, capital is apparently reaping a modest reward now. Before the system of protective duties was introduced the returns on investments in iron and steel works were ruinously small. The record of the machine shops and foundries is a much more favorable one. While 23 out of the 53 paid no dividends in 1879, only eight of the identical companies had nothing to distribute among their stockholders in 1855, and not less than nine of them paid 10 per cent. and above.

Probably at no other time has so much attention been given to devices for determining the calorific power of fuel as during the past few years, an urgent demand having sprung up for an apparatus which, without being too complicated, would yield reasonably accurate figures. To obtain concordant results with the same coal tested at different times has been practically impossible with the means hitherto available, and guesswork has entered very largely into the various determinations. Approximate values only could be obtained, and experience seems to prove that the approximations have in many cases been so crude as to make the values of the figures obtained extremely doubtful. Improved apparatus and renewed investigation have therefore become pressing necessities, and are obviously essential to reliability in the solution of many questions of every-day occurrence in steam engineering. It is a noticeable fact that in England, and particularly in France, special activity has been displayed in this line of work, and, while the results perhaps have not yet shown any marked improvement over the material already at hand, there is an undeniable prospect of greater success in the near future. The importance of the whole subject is clearly apparent and should prove generally a stimulus to close study of the requirements for success.

The Outlook in Pig Iron.

During the past few weeks the market reports reflecting the condition of the pig-iron trade have lost some of their monotony, and from different quarters come the indications of a turn in the tide. The condition of the trade has been mixed for months, this having been particularly noticeable where Southern iron is fighting for a foothold or is endeavoring to secure an outlet for larger quantities. Where consumers take only the best grades and are consistently conservative the trade has been very firm, but uneventful. A few brands of Southern iron have conquered a recognized standing for good quality. At points where a wider range of quality finds buyers, as in Philadelphia, the business has been uneven. An evident oversupply of inferior irons has pressed on values, and we have the phenomenon of indifferent sellers of standard pig side by side with weak holders of other kinds. The majority of those producers in the Lehigh and Schuylkill valleys who do not largely use their own product are quite well supplied with orders, and have no stocks likely to prove embarrassing to them. On the other hand, lower grades of iron, largely of Southern produce, have sought a market eagerly. Thus, according to their source, the reports of individual makers, while truthfully reflecting the state of affairs as seen from their point of view, would appear widely contradictory. In Cincinnati and other markets into which Southern iron goes largely the tone is one of uncertainty, and even Pittsburgh has been made to feel the competition from the new section. It has been vigorously pushed in all directions, causing uneasiness wherever it goes, probably far out of proportion to the importance of the share of the market which it seeks to secure. From the Northwest come, as usual, the harbingers of better times. Both Chicago and Detroit have begun to feel greater activity, and it depends largely upon the developments of the next four or six weeks whether this movement will grow in strength and will spread to other parts of the country. We are producing pig iron at a very heavy rate, but it must not be forgotten that much of the increase during the past six months is due principally to heavy requirements of the rail mills, which still occupy an isolated position of prosperity. The figures are not available upon which to base a comparison, but the large sales of rails to date, fully 1,150,000 tons, as compared with a total output of 959,471 tons in 1885, justify the rough estimate that at least 450,000 tons of pig iron more will go into that form of manufacture than did last year. A part of this, of course, has been covered by imports of foreign iron, among which is the Spanish lot of 30,000 tons of Bessemer pig, the recent arrival of which has attracted so much attention. Still, taking into account this circumstance, it cannot be questioned that consumption has not been called to deal with so large an increase in foundry and forge iron as a superficial examination of recent blast-furnace statistics might be thought to show. While there has been an increase, accounts from all sections of the country agree substantially in representing the stocks to be light. Surveying the field generally it will be conceded that, so far as pig iron is concerned, the situation is fairly favorable. The period of dullness growing out of the labor strikes appears only to have stayed a movement to a higher level. It could not materially weaken the producers of standard qualities. On the other hand, any moderately sustained impulse given to the trade by a quickened demand would create a rising tendency. We are on the threshold of the time when this movement generally makes its appearance, and if the past be accepted as a guide to the future the first indications will come from the West.

Mechanical Refrigeration.

With the various types of refrigerating machines now in common use the reduction of temperature, as generally known, is obtained either by the expansion of air or by the passing into the gaseous state of various simple volatile liquids, such as sulphurous acid, ammonia and sulphuric ether. No chemical action whatever occurs in the operation of these machines, and Mr. Raoul Pictet, who is well known from his work in connection with them, has found that whatever be the liquid employed, as in the latter case, the power required in compressing is constant for the same difference of temperature between the compression and expansion cylinders and for the same cooling effect. An entirely different condition, however, presents itself if, in place of a single

volatile liquid, we use a mixture, capable of being separated into two or more liquids by a lowered temperature, and of combining intimately on a rise in temperature. In that case the relation between the different vapor tensions and the corresponding temperatures no longer bears any similarity to that observed with the simple liquids.

In a paper published in one of the German chemical journals some time ago Mr. Pictet undertook to show to what extent this was borne out by practical results, and directed attention to the common law that the combination of oxygen with any desired molecule of a volatile liquid decreased its volatility and raised its boiling point. Thus carbonic oxide (CO) boils at a temperature of −140° C. and carbonic acid (CO_2) at −75°; sulphurous acid (H_2 SO_3) at −10°, and sulphuric acid (H_2 SO_4) at +32°; nitrogen (N) again boils at −180°, while hyponitric acid boils at +25° and nitric acid (H NO_3) at +50°. Following this law Mr. Pictet oxidizes carbonic acid by the addition of sulphurous acid, and thus obtains a line of highly volatile liquids with boiling points ranging from −71° to −7.5°. With these liquids is observed the common property of a complete combination of the component parts at high temperatures and a decomposition at low temperatures into different volatile products, each of which liberates its own special gas. The sum of the tensions of these gases largely exceeds the tension of the gas evolved by a simple volatile liquid, but at the higher temperature the several liquids are united into one, and the maximum tension of the gases is then appreciably reduced, owing to the special relations developed. Mr. Pictet has compiled a table in which the tensions of S CO_4 and of SO_3 are compared between the temperatures of −30° and +50°. From this we take the following figures:

	S CO_4. Atmospheres.	SO_3. Atmospheres.
Tensions at −30°.....	0.77	0.36
Tensions at −20°.....	0.96	0.61
Tensions at 0°.....	1.63	1.51
Tensions at +20°.....	3.40	3.30
Tensions at +30°.....	4.45	4.60
Tensions at +40°.....	5.72	6.20
Tensions at +50°.....	6.56	8.30

These show that at the higher temperatures the tensions of the combined gases are much lower than those of one of the gases alone.

From all this it is concluded that if the liquid S CO_4 be used in a refrigerating machine the tension of the vapors in the expansion cylinder will be considerably higher than that of the sulphurous acid vapors, for example, while the tension during compression, when the vapors are again brought to the liquid state, will also be lower. There would accordingly be a saving in the work of compression, and the formation of these new volatile liquids, it is argued, would thus present a yet undeveloped line of work in connection with refrigeratng machinery. There is an apparent anomaly in all this which may at first give rise to some confusion, but much of which will be found to disappear on careful consideration of the various points involved.

North vs. South for Cheap Iron Making.

To the Editor of The Iron Age: DEAR SIR—So much has been written and said for the past 10 years in regard to the abundance of cheap raw materials all over the South, especially when referring to West Virginia and Alabama, and so many flourishing accounts have been made, that it has actually had the effect to retard somewhat the operations in some of the older iron-making districts, perhaps to the advantage of the too many that have kept fully running. But it is quite surprising that we do not hear of more dividend-paying concerns from those establishments that have been making pig iron for $9, $10 and $11 per ton. Quite a respectable number of pig-iron makers North have made dividends with pig iron averaging for the past 10 years about $16.75, f.o.b. on cars at furnaces, or $17.75 at tidewater. Now if it is true, as it doubtless is, in regard to the cost of production at several points, proved and to be proved, South, that Nos. 1 and 2 pig iron can be put on the cars at furnaces at from $10 to $11 per ton, and the transportation of it to leading markets North and West will not exceed an excess of over $3.50 per ton over the cost of transporting to the same points from Pennsylvania and other furnaces North, then most certainly there would seem to be cause for an exodus of ironmen and capital to these new regions at once. But will the raw material hold out so cheap? What is the history of the cost of mining ores between new workings and old? What is the history of the wages of labor in any section after a certain amount of local population is all taken up and more is required? Any one who is conversant with the subject for a period of from 20 to 40 years in mining iron ores or coal, or manufacturing iron in any form, can answer very well. The writer has been over a considerable portion of the great metalliferous belt from Canada through New York, New Jersey, Pennsylvania, Maryland and Virginia to near the Tennessee line, several times in the past 36 years, and is very willing to acknowledge the existence of some grand localities in all these places, and some of the very best have not yet been utilized. Yet it is very doubtful if any location has yet been discovered where a steel rail can be made cheaper than it is now produced at any of the large mills in Pennsylvania, or may yet be done on the Hudson or in the West. A great fact must not be overlooked. Where is most iron used? and where will it be used during the next decade or two? And the freight charges on it—what will they be? It is safe to state that for all uses to which iron is put fully three-fourths is laid in tracks or used for machinery building, &c., north of 38° north latitude in our own country, and this is likely to continue for a decade or two, for very many good reasons. The six great States of North Carolina, South Carolina, Georgia, Alabama, Mississippi and Louisana combined do not use or require as many tons yearly as the single States of Ohio, Pennsylvania or Illinois. Hence, (though perhaps no fault of their own) the fact remains that these States cannot for a long time to come have the ability to buy—nor in reality the need of—large quantities, nor can some of them expect to have a credit they might be entitled to, until some provision shall have been made to satisfy honest and innocent holders of some of their defaulted bonds. To build railroads or make extensive internal improvements requires either cash in hand or good credit. It may be true that for some of the defaulted debts of these States the State itself did not get full value. Neither did New York City for the debt incurred under the Tweed ring management; yet New York pays the debt, principal and interest, and enjoys a high credit by reason of such action. The moral of the whole matter is that the States, municipalities or corporations that pay their debts have good credit and can float their 3 or 4 per cent. bonds at a premium, and they thus attract both new capital, skill and labor. The combination of these three items is just what is wanting in several portions of the South to give permanent prosperity. Very truly,

C. S.

JUNE 23, 1886.

METALLURGICAL.

The Shortness of Iron and Steel at a Blue Heat.

A number of earlier writers, and later Valton, Walrand, Huston and Kollmann, have in turn called attention to the property of iron and steel to show a remarkable lowering in tenacity at certain temperatures, approaching a blue heat. Professor Ledebur, of the Freiberg School of Mines, in *Glaser's Annalen für Gewerbe und Bau Wesen* cites an instance in which a breakdown may, according to his view of the case, be attributed to the fact that the material was made at this dangerour heat. A new pump rod was put in at a mine, Bessemer steel being chosen, which showed a tenacity of nearly 50 kg. per square millimeter, or 70,000 pounds per square inch, and an elongation of 20 per cent. The rods had an ample section for the duty, and yet one of them soon broke after being put in, and a number of other breaks followed within a year. On examining the fractures it was shown that a fine crack running vertically to the axis of the rod had existed before the break took place, the smooth surface of what had been the crack contrasting plainly with the characteristic fine texture of the actual fracture. Etching the polished surface of a break did not develop anything in particular except a number of small fine blow-holes growing more numerous toward the center. Their presence could not, however, be held to account for the breaks. A careful analysis of two of the broken rods showed the following composition:

	No. 1.	No. 2
Carbon.....	0.209	0.236
Silicon.....	0.050	0.356
Phosphorus.....	0.045	0.009
Sulphur.....	0.048	0.040
Arsenic.....	0.048	0.045
Antimony.....	0.045	0.031
Copper.....	0.101	0.095
Manganese.....	0.430	0.630

The only somewhat remarkable fact in connection with these analyses were the comparatively high arsenic and antimony, which, together with the sulphur and the copper, might be regarded as the source of some red-shortness. In order to obtain certainty on this point, samples of the rods were sent to two different iron works with the request that they be carefully examined for their welding properties. No. 1 showed only a faint trace of red-shortness under very rigid tests, and No. 2 indicated none whatever. Professor Ledebur holds, therefore, that the rods were probably worked at the dangerous blue heat.

Uniformity of Open-Hearth Steel.

Mr. George E. Thackray, of Pittsburgh, during the discussion of a paper by Mr. H. M. Howe at the Bethlehem meeting of the Institute of Mining Engineers, gave some data to show the uniformity of open-hearth steel. The first lot comprised 73 consecutive heats of steel containing 0.18 per cent. carbon, and was made on an order for structural plates. The second lot comprises 26 consecutive heats of steel for boiler plate, containing from 0.13 to 0.16 per cent. carbon, to suit different requirements. The average deviation of carbon is found by taking the difference between the desired and obtained carbon contents of each heat, taking the arithmetical sum of such differences, and dividing this sum by the number of heats. The results were as follows: 1. The average deviation of carbon of 73 consecutive heats of open-hearth steel, containing 0.18 per cent. carbon, was found to be 0.0068 per cent. 2. The average deviation of carbon of 26 consecutive heats of boiler-plate steel was found to be 0.0033 per cent.

High-Silicon Steels.

Three patents have been granted, under date of June 1, 1886, to Robert Hatfield, of Sheffield, England, whose high-manganese steel has attracted so much attention during the past year. The first of Mr. Hatfield's patents relates to a high-silicon steel. He claims to have discovered that if 1.5 to 5 per cent. of silicon is present in steel the product is not only of superior quality, but that the presence of sulphur and phosphorus is of no disadvantage. He introduces the silicon by means of a special silicon pig. He claims for this high-silicon steel special advantages, using the following language in his specification: "My improved steel thus manufactured possesses, after tempering, peculiar hardness (depending in degree on the amount of silicon which it contains), so that it is specially adapted for what are known as 'tool-steel' purposes, edge tools, &c. It has also other peculiar and valuable characteristics, among which I would mention that it has great toughness compared with the tool steel now used. It is more waxy and malleable in working when heated than high-carbon steel, and is therefore more readily shaped under the hammer, and when cold is more easily cut and tooled than ordinary steel. It is not so brittle as ordinary steel, and is less liable to be burned in heating, and to what is known as 'water-cracking.' It is also susceptible of hardening and tempering by the same metheds and with substantially the same effect as carbon steel."

In a second patent he claims as a new article of manufacture steel containing in combination both carbon and silicon in the proportions of from 0.25 to 2.5 per cent. of carbon and 0.75 to 1.5 per cent. of silicon. Mr. Hatfield puts forward his pretensions to novelty as follows: "I have discovered, however, that by adding silicon to iron in certain proportions—say above ¼ of 1 per cent. of silicon—the same capacity for hardening and tempering is acquired by the iron with which it is incorporated as is given to iron by the addition of carbon only in the ordinary steel-making processes heretofore practiced, with this peculiar advantage, however, in favor of silicon and carbon over carbon only, that the steel made with silicon and carbon instead of carbon only is softer and more easily worked before tempering, and becomes harder, though less brittle, after tempering than carbon steel. I have also discovered that when the silicon is present in sufficient quantity—say ¼ to 1½ per cent.—I can use as my carbon addition white hematite iron of such a comparatively low grade as is now unfit for steel-making, owing to its high sulphur; consequently, the silicon is found to neutralize the injurious effects of sulphur and phosphorus, and I thus obtain a steel giving the same results as the high-class steels made from expensive foreign and other iron substantially free from these ingredients—sulphur and phosphorus. This remark also applies to the presence of sulphur and phosphorus in any part of the charge from which my steel is made, the resulting steel product being of very superior quality, although made with comparatively cheap materials."

Basic Steel for Shipbuilding.

Mr. B. Martell, of Lloyd's spoke as follows in a recent paper read by him before one of the English societies:

I cannot conclude without a passing reference to recent experience as to the suitableness of steel produced by the basic process for shipbuilding purposes. There is no doubt that mild steel is being produced by this process of a reliable quality at a comparatively low tensile strength, and well suited for many purposes to which it can be applied; but experience has abundantly proved that up to the present time basic steel has not been produced possessing those uniformly ductile and reliable qualities at high tensile strength necessary for shipbuilding purposes. Some time ago some vessels were being built in Germany under the inspection of Lloyd's surveyors to class in their register, and, owing to the many failures which were occurring in the material, I was instructed to visit the Continent to investigate the cause. I ascertained that the steel being used was made in Germany by the basic process, and, on testing a large quantity of it, found it very unreliable and unsuitable for the purpose. The manufacturers, after testing a number of vessels' frames which they had turned out at their own works, admitted its unreliability, and gave me a written guarantee that no steel in future made by the basic process should be supplied for these vessels, as they were unable with this material to fulfill the conditions laid down by Lloyd's Register Committee. Very recently striking evidence has been adduced in this country that those who undertook to supply steel for vessels to class in Lloyd's Register have been unable to fulfill the conditions imposed with steel made by the basic process, and have had to relinquish the attempt. Under these circumstances the committee of Lloyd's Register have felt compelled to decline for the present to accept steel made by the basic process for vessels intended for classification in their register book. Such great advances, however, have been made in recent years in perfecting the quality of mild steel, and such thoroughly reliable and uniferm material is now being made by the Siemens-Martin process, that it can only be hoped similar success will ultimately attend that produced by the basic process for shipbuilding purposes, and that the surviving inventor of the system by which it is made will live to reap the full reward of the labor and intelligence which have already been brought to bear upon its production.

Messrs. Levi E. Felty and William Floyd, of Homestead, Pa., have been granted a patent, dated June 1, for a heating furnace for gaseous fuel, which, we are informed, will be in operation in a few months.

Mr. John Gjers, of Middlesboro', England, recognizing the drawbacks of his ordinary soaking-pits when the ingots are cast at some distance from the rolling mill, has patented a modified design providing for auxiliary heating arrangements. The soaking-pits are in the form of vertical fire-clay retorts set in a combination chamber. This patent is dated May 18, 1886. A second patent of the same date provides for heating the soaking-pits internally while they are empty.

Civil Engineering in the Massachusetts Institute of Technology.

We are indebted to Mr. George F. Swain, associate professor of civil engineering, for a circular giving an account of the course in civil engineering at the Massachusetts Institute of Technology, as arranged and essentially modified a short time ago. A modification which is deserving of the highest commendation is the introduction of optional studies into the regular course. By this alteration the range of studies has been materially enlarged, and the student has a correspondingly greater latitude of choice. The advantages of giving the student a certain amount of liberty of individual preference in the selection of studies is far from being universally recognized, but the practice is one which is destined to a much more general observance, and the Massachusetts Institute of Technology is to be congratulated on having taken an advanced position in the matter.

The full course at the Massachusetts Institute of Technology occupies a period of four years. During the first year the studies are the same in all departments of the school, while at the beginning of the second year the course in civil engineering proper begins. The first year instruction is given in algebra, geometry, trigonometry, chemistry and drawing, besides French, rhetoric, &c. The second year the student takes up analytical geometry, spherical trigonometry, differentical calculus, surveying and physics, in addition to other less scientific studies. In the third year railroad surveying, theoretical and field work receive a considerable share of attention, while in pure mathematics the course includes integral calculus and mechanics. In the fourth year the student has a choice between the general course, the railroad course, and the course in geodesy and astronony. The general course includes strength of materials, sanitary engineering, hydraulics, bridges and roofs, metallurgy in iron, &c., with options in related studies. The railroad course is in part the same as the general course, with the addition of applied mathematics in railroad engineering. The course in geodesy and astronomy covers a good deal of ground common to the other two courses, besides embracing the special studies indicated in the name of the course and options in higher mathematics. The instruction is given by lectures and recitations, together with practice in the field whenever the subject admits, and by exercises in the drawing-room. Before completing his course the student is required to select some subject and to present an acceptable thesis upon it, embodying the results of original investigation or design, accompanied in the latter case by the necessary computations, drawings and estimates.

WASHINGTON NEWS.

(*From Our Regular Correspondent.*)

WASHINGTON, D. C., June 29, 1886.

The promised tariff bill from Mr. Randall has been introduced and referred. It now remains to be seen what will be done with it. Mr. Randall said of the bill to the correspondent of *The Iron Age*: "Its inception was from the standpoint of protection of American labor. All legislation for regulation and revenue has been for the protection of American manufacturers. We find the wages of labor constantly tending downward. Mechanical appliances have increased the productive capacity of all our industries, agricultural as well as manufacturing. It therefore becomes necessary to increase the demand for labor by increasing the field of manufactures. This bill, therefore, is designed to protect labor by promoting the manufacture at home of certain articles now largely imported. The bill raises duties in many instances, equalizes in others and in a few reduces. It reduces internal revenue tax, which was created as a war necessity and never was permanently an integral part of our revenue system. It also modifies the laws in regard to the collection of duties. One of the greatest sources of competition is the inability to effectively punish fraud on the revenue. The frauds of undervaluation have simply become enormous, and in the case of cutlery, as an instance, has almost ruined certain branches of manufactures. Enforced idleness of mills, through no demand on account of ruinous foreign competition, falls heaviest upon labor. Something must be done to give American labor and capital a monopoly of American markets in everything we can produce."

THE EFFECT OF THE BILL.

It is claimed for the bill that, while it will make a reduction of $9,000,000 in revenue, the reduction will be in a loss of duty on articles which the bill proposes shall be manufactured at home. In the item of tin plate it is shown that no less than $20,000,000 is paid out of the country for that article alone. We are said to be larger consumers of tin plate than almost the rest of the world together. Twenty millions of market for tin plate, it is claimed, would in itself give labor a large field of employment, as the protective duty proposed would establish prices which would stimulate investment in that branch of industry. In the item of iron or steel beams, girders or joists it has been found that Belgian beams are not only running English beams out of their own markets, but are threatening to seriously interfere with our own. The duty proposed is 1 cent per pound. The duty of $13 per ton on iron and steel railway bars and $16 per ton on iron and steel T-rails and flat rails punched is fixed on the ground of equalization. Boiler iron is placed at 1¼ cents per pound; sheet iron, 1 cent per pound; horse-shoe nails and wire nails, 3 cents per pound; round iron, 1 cent per pound; lead in pigs and bars and scrap lead, 1½ cents per pound; lead in sheets, 2¼ cents per pound.

THE PROSPECTS OF THE BILL.

The Committee on Ways and Means will determine the fate of the Randall bill. Whether they will be willing to give the bill a chance for discussion and action will be known later. The lateness of the session may be a plea on the part of Morrison and his friends for non-action in the committee, but with the President determined to scrutinize the appropriation bills by items it is more than likely that the day of adjournment will reach a later date than at first counted upon. The incorporation of the principal features of the Hewitt administrative reform bill recommends it in a measure to that gentleman on the committee, although there are some items in the metal schedule which he does not like. The greatest trouble is likely to arise through the opposition of the Republican members of the committee. The wool portion of the bill is not wholly objectionable to Major McKinley, of the committee, as it is better than existing rates. The chief ground of opposition on the part of the Republicans will be opposition to agitation, but this will not satisfy many Western Republicans, who have always been shaky, but have been held in the traces through party discipline. It is proposed, however, to take the bill up in the Committee on Ways and Means and sound the members. A very few minutes will decide whether it will ever see daylight again. At the meeting of the Democratic "Steering" Committee yesterday Speaker Carlisle, Mr. Randall and Mr. Morrison, composing that combination of parliamentary omnipotence for the rest of the session, there was shown an inclination to allow the bill to rest until next session.

WHAT THE REPUBLICANS THINK OF IT.

The Republican leaders are disposed to criticise the bill, and do not give it credit for even the redeeming feature of reduction of internal revenue taxes which they have always been advocating as a movement to cover the flanks of the tariff. It would be a curious turn in affairs to see the Republicans divide on a Democratic tariff bill, as the Democrats have been doing. Within the past two weeks we have seen 35 Democrats voting with the Republicans against free trade, and four Republicans voting and one paired with the Democrats against protection. There are other Republicans who were not willing to go so far as the Morrison bill, but they say that they can support a measure on the general principles embodied in the Randall bill. There is no question that the move of Mr. Randall is one of the most important in our tariff history since the days of nullification and the Clay compromise. It may materially modify the relation of both parties to that great economic question.

STRUCTURAL TEST COMMISSION.

All prospects of pasaing the bill for the appointment of a commission to take charge of certain experiments and formulation of results in testing structural materials have vanished for the present session, and doubtless for the Congress. The "Steering" Committee of the House have determined to adhere very closely to the appropriation bills. The structural test bill is now on the calendar as the unfinished business of the Committee on Manufactures. If another call of the committee could be had, with a little vigorous management the bill could be passed. It has an undoubted majority, and it is believed by its friends that it has two-thirds. If a careful canvas, should make that fact positive, and the assent of the Speaker to a recognition could be obtained, the bill might even then be carried under a suspension of the rules. It is to be regretted that a measure so vitally important to the mechanical industries and building trades should be permitted to languish.

RECENT CUSTOMS DECISIONS.

The Acting Secretary decides that imported steel in sheets is in nowise covered by Paragraph 151, Schedule C, unless it is galvanized or coated with zinc or spelter or other metals, or an alloy of those metals.

CLASSIFICATION OF IRON BOILERS FOR DUTY.

The Acting Secretary of the Treasury has decided that certain imported boilers are dutiable at 1½ cents a pound, as articles not specially enumerated, made from boiler or other plate iron, whether wholly or partially manufactured, instead of 45 per cent. ad valorem, on the ground that the boilers in question are not made from ordinary boiler and tank plate iron, but from wrought iron varying from 1 inch to 1½ inches in thickness; that it is different from boiler and tank plate iron only in thickness and that, notwithstanding its thickness, it is comprehended in the term "plate iron," and that, inasmuch as these boilers are made of plate iron, which in each instance is the material of chief value, they are dutiable as claimed by the appellants.

DUTIABLE CHARACTER OF BASE BULLION ORES.

The Acting Secretary of the Treasury has issued the following directions in regard to the assessment of duty on certain ores: First, base bullion in which lead predominates in weight should be classified under the provision for "lead in pigs;" and, second, that ores composed of silver and lead and iron, or silver and lead, or silver and other base metals of which silver is the component material of chief value, would be exempt from duty under the provision in the free list for "ores of * * * silver." The Acting Secretary has also decided that sheep shears are dutiable at 45 per cent. as manufactures of steel, and not at 35 per cent. as cutlery. The Treasury Department has reversed an assessment of 45 per cent. duty on certain so-called surgical scissors as a manufacture of steel, and has rated them at 35 per cent. as cutlery not specially enumerated, declaring "that scissors with bent blades, adapted for clipping horses, button-hole scissors, &c., table knives and forks, and table steels, come within the purview of and are liable to the duty prescribed for 'cutlery.'"

ALLOWANCE FOR INCREASED WEIGHT OF IRON ORE.

A number of appeals upon an assessment of duty at the rate of 75 cents per ton on the weight of certain imported iron ore having been received, the Treasury Department has instructed customs officers that "duties must be assessed on the actual quantity of merchandise imported, as shown by the returns of the weigher, gauger or measurer, as the case may be," except that an allowance may be made for damage by sea-water on the voyage of importation, or on account of excessive weight caused by "accident or unusual leakage," or absorption of moisture or sea-water on the voyage of importation, but that before such allowance can be made the importer must file due application therefor with the collector of customs within 10 days after the landing of the goods, and have the percentage of damage or increased weight, as the case may be, duly ascertained and reported by the appraiser. The Secretary adds: "Nothing would seem to prevent the appraiser, when estimating the percentage of increase of weight, from considering the report of the analytical chemists employed by the shippers and the importers of the ore as a basis for the purpose of definitely determining the quantity of dry ore imported, it being understood, however, that the appraiser shall use his own judgment in such matters, and shall only accept the reports of such chemists when satisfied that they are substantially correct.

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Springfield Fdry. Co., Springfield, Mass. 16
Syracuse Mall. Iron W'ks, Syracuse, N. Y. 4
The U. S. Mitis Co., 26 Broadway, N. Y. .. 3
Wetherill Robt. & Co., Chester, Pa. 55
Castings, Iron and Brass.
I. S. Spencer's Sons, Guilford, Conn. 34
Castings, Steel.
Eureka Cast Steel Co., Chester, Pa. 56
Flagg Stanley G. & Co., Philadelphia 56
Johnson I. G. & Co., Spuyton Duyvil, N. Y. 56
Pittsburgh Steel Casting Co., Pittsburgh. 56
Pratt & Letchworth, Buffalo, N. Y. 56
Standard Steel Casting Co., Thurlow, Pa. 56
Syracuse Steel Foundry, Syracuse, N. Y. .. 48
The U. S. Mitis Co., 26 Broadway, N. Y. .. 3
Chains.
Bradlee & Co., 816 Richmond St., Phila. .. 5
Covert Mfg. Co., West Troy, N. Y. 18
Wm. H. Haskell Co., Pawtucket, R. I. 53
Chemicals.
Eimer & Amend, 205 Third av., N. Y. 9
Gridley & Co., 87 Maiden lane, N. Y. 13
Salom & Westesson, Philadelphia, Pa. 5
Cherry Stoners.
Enterprise Mfg. Co., Philadelphia, Pa. 50
Chisels, *Manufacturers of.*
Buck Bros., Millbury, Mass. 13
Chucks.
Smith & Egge Mfg. Co., Bridgeport, Conn. 40
Union Mfg. Co., 103 Chambers, N. Y. 7
Cider Presses.
N. Y. Plow Co., 57 Beekman, N. Y. 16
Clamps.
Woodruff, Miller & Co., Mt. Carmel, Ct. .. 15
Clippers, Horse and Barber's.
Lee Jesse & Son, Philadelphia, Pa. 41
Clock Springs, &c.
Dunbar Bros., Bristol, Conn. 7
Clothes Dryers.
Campbell John, Manchester, N. H. 46
Coal.
Borden & Lovell, 70 West, N. Y. 4
Pardee A. & Co. 111 Broadway, N. Y. 48
Cocks, Steam, Gas, &c.
Fairbanks & Co., 311 Broadway, N. Y. 55
Coffee and Spice Mills.
Enterprise Mfg. Co., Philadelphia, Pa. 50
Lane Bros., Poughkeepsie, N. Y. 50
Coke.
Schoonmaker J. M., Pittsburgh 4
Commission Merchants, Iron, Steel, &c.
Howard, Childs & Co., Pittsburgh, Pa. .. 4
Copper.
New Haven Copper Co 294 Pearl, N. Y. .. 2
Copying Presses.
Illinois Iron & Bolt Co., Carpentersville, Ill. 30
Cordage.
Elizabethport Steam Cordage Co., 48 South, N. Y. 34
Tolman J. P. & Co., Boston, Mass. 7
Corrugated Iron.
Cincinnati Corrugating Co., Cincinnati .. 8
Knisely & Miller, Chicago, Ill. 18
Moseley Iron Bridge & Roof Co., 5 Dey, N. Y. 4
Standard Iron Co., Bridgeport, Ohio 48
Cotters, Spring Keys, &c.
Browning, Sisum & Co., Brooklyn, N. Y. .. 41
Coverings, Boiler and Pipe.
Chalmers-Spence Co., 419 Eighth, N. Y. .. 9
Shields & Brown, Chicago, Ill. 16
Crucibles.
Seidel R. B., Philadelphia, Pa. 51
Cupolas.
Colliau Furnace Co., Detroit, Mich. 47
Schmitz, E. J., 202 E. 76th, N. Y. 36
Curry Combs.
Muncie Novelty Co., Muncie, Ind. 10
Cutlery, *Importers of.*
Clatworthy F. & W., 82 Chambers, N. Y. .. 10
Cutlery, *Manufacturers of.*
American Cutlery Co., Chicago, Ill. 50
Empire Knife Co., West Winsted, Conn. 36
Humason & Beckley Mfg. Co., New Britain, Conn. 34
The Hatch Bros. Co., Bridgeport, Conn. .. 37
Dog Collars.
Medford Fancy Goods Co., 707 Broadway, N. Y. 6
Pope & Stevens, 114 Chambers, N. Y. .. 46
Door Bells.
Bradley & Pierson Mfg. Co., 298 Broadway, N. Y. 44
Door Bolts.
Ives H. B. & Co., New Haven, Conn. 41
Door Checks and Springs.
Shaw Door Check & Spring Co., Boston, Mass. 10
Watts Mfg. Co., 480 Pearl st. 36
Door Hangers, House and Barn.
Dunham Mfg. Co., Boston, Mass. 15
Lane Bros., Poughkeepsie, N. Y. 5
Medina Mfg. Co., Medina, N. Y. 37
Moore Mfg. Co., Chicago, Ill. 50
Scranton Mfg. Co., Chicago, Ill. 50
Stearns E. C. & Co., Syracuse, N. Y. 56
Syracuse Bolt Co., Syracuse, N. Y. 12
The "Standard" 18
Victor Mfg. Co., Newburyport, Mass. 18
Door Holders.
Sise, Gibson & Co., 100 Chambers, N. Y. .. 40
Door Hasps.
Sweet & Clark Mfg. Co., Troy, N. Y. 50
Door Knobs.
Victor Door Knob Co., Cleveland, O. 40
Door Springs.
Coiled Wire Belting Co., 93 Cliff, N. Y. .. 52
Drawing Knives.
Wheeler, Madden & Clemson Mfg. Co., Middletown, N. Y. 14
Drilling Machines.
Herrick & Cowell, New Haven, Conn. 55
Wiley & Russell Mfg. Co., Greenfield, Mass. .... 43&56
Drop Forgings.
Beecher & Peck, New Haven, Conn. 54
Merrill Bros., 26 First, Brooklyn, E. D. 46
The Billings & Spencer Co., Hartford, Conn. 3
William Rose & Bros., West Phila., Pa. 7
Drop Presses.
Beecher & Peck, New Haven, Conn. 54
Stiles & Parker Press Co., Middletown, Conn. 56
Waterbury Farrel Foundry and Machine Co., Waterbury, Conn. 46
Dynamite.
Ætna Powder Co. Chicago, Ill. 15
Eave Trough Hangers.
Heartley Geo. W., Toledo, O. 34
Edge Tools, *Makers of.*
White L. & I. J., Buffalo, N. Y. 12
Egg Beaters.
Paine, Diehl & Co., Philadelphia 50
Electric Lighting.
Brush-Swan Electric Light Co., 204 to 210 Elizabeth, N. Y. 53
The Brush Electric Co., Cleveland, O. 6
Western Electric Co., Chicago Ill. 2
Electrical Supplies.
Wollensak J. F., Chicago, Ill. 36
Elevators, *Makers of.*
Morse, Williams & Co., Philadelphia, Pa. 55
Stokes & Parrish Machine Co., Phila. 54
Emery Paper, Cloth, &c.
Montgomery & Co., 105 Fulton, N. Y. 10
Walpole Emery Mills, South Walpole 30
Engineers.
Gordon, Strobel & Laureau, Phila., Pa. .. 5
Engines, Gas.
Clerk Gas Engine Co., Philadelphia, Pa. .. 55
Dickson Mfg. Co., Scranton and Wilkesbarre, Pa. 55
Schleicher, Schumm & Co., Phila. 55
Engines, Hot-Air.
McKinley Engine Co., Cincinnati, O. 9
Engines, Steam, *Makers of.*
Cooke & Co., 22 Cortlandt, N. Y. 9
Dickson Mfg. Co., Scranton and Wilkesbarre, Pa. 55
Prospect Machine and Engine Co., Cleveland, O. 46
Southwark Foundry and Machine Co., Philadelphia, Pa. 55
The Norwalk Iron Works Co., S. Norwalk. 54
Wetherill Robt. & Co., Chester, Pa. 55
Expanding Mandrels.
Cooke & Co. 22 Cortlandt, N. Y. 9
Export Agents.
Tommins Francis J. P., 26 Warren, N. Y. 51
Facings, Foundry.
Fitzmorris & Smith, Kindel and Central avs., Cincinnati, O. 45
Paxson J. W. & Co., 514 Beech, Phila. 5
S. Obermayer Foundry Supply Mfg. Co., Cincinnati, O. 15
Farriers' Tools.
Heller & Bros., Newark, N. J. 8
Faucets, *Makers of.*
McNab & Harlin Mfg. Co., 56 John, N. Y. .. 53
Faucets, *Self-Measuring, Makers of.*
Enterprise Mfg. Co. of Pa., Phila. & N. Y. 50
Fence Machines.
Henley M. C., Richmond, Ind. 45
Fences, Wrought Iron.
Champion Iron Fence Co., Kenton O .. 46
National Wire and Iron Co., Detroit 3
Fencing and Cresting.
National Wire & Iron Co., Detroit, Mich. .. 3
Files, *Importers of.*
Montgomery & Co., 105 Fulton, N. Y. 10
Moss, F. W. 80 John, N. Y. 48
Files and Rasps, *Manufacturers of.*
Barnett G. & H., 41 & 43 Richmond, Phila. 8
Everhart, James M., Scranton, Pa. 56
Heussler, Christian, Philadelphia, Pa. 8
J. Barton Smith Co., Philadelphia, Pa. 38
Madden & Cockayne File Co., Middletown, N. Y. 56
McCaffrey & Bro., 1732 & 1734 N. 4th, Phil. 8
McClellan File Co., E. Saginaw, Mich. 31
Nicholson File Co., Providence, R. I. 5
Paul Chas. B. Williamsburg, N. Y. 8
Union Saw Co., 337 Broadway, N. Y. 47
Fire Brick, *Makers of.*
Borgner & O'Brien, Philadelphia, Pa. 50
Gardner James, Pittsburgh, Pa. 50
Kreischer B. & Sons, foot E. Houston, N. Y. 50
Newton & Co., Albany, N. Y. 50
Ostrander James & Son, Troy, N. Y. 50
Birmingham Fire Brick Works, Birmingham, Ala. 50
Union Mining Co., Philadelphia, Pa 50
Valentine M. D. & Bro. Woodbridge 50
Fishing Tackle, &c.
Dame, Stoddard & Kendall, Boston, Mass. 10
Flour Sifters.
Hunter Sifter Mfg. Co., Cincinnati, O. 45
Forges, Portable, &c.
Bradley & Co., Syracuse, N. Y. 56
Brown & Patterson, Brooklyn, N. Y. 7
Buffalo Forge Co., Buffalo, N. Y. 14
Bullock T. H., Cleveland, O. .... 14&40
Champion Blower and Forge Co., Lancaster, Pa. 30
Empire Portable Forge Co., Cohoes, N. Y. 52
Forgings, Iron and Steel.
Hicks & Dickey, Philadelphia, Pa. 4
Foundry Supplies.
Fitzmorris & Smith, Kindel and Central avs., Cincinnati, O. 45
Paxson J. W. & Co., Philadelphia 5
S. Obermayer, Foundry Supply Mfg. Co., Cincinnati, O. 15
Furnace Hoists.
Stokes & Parrish Machine Co., Phila., Pa. 54
Furnace Lamps.
Taylor & Boggis Fdry Co., Cleveland, O. .. 6
Garden Tools.
Dunlap, C. W., 95 Reade, N. Y. 40
Gas and Steam Fitters' Supplies.
Pancoast & Maule, Philadelphia, Pa. 46
Gin Ribs, &c.
Lombard Chas. F., Augusta, Ga. 4
The Brown Cotton Gin Co., New London. 24
Glass Cutters
Monce, S. G., Bristol Conn. 49
Grate Bars.
Lovegrove & Co., Philadelphia 49
Grease Cups.
The Walker Mfg. Co., Cleveland, O. 37
Grindstones.
Berea & Huron Stone Co., Cleveland, O. .. 47
Wood, Walter R., 283 and 285 Front, N. Y. 47
Gunpowder, *Makers of.*
King's Great Western Powder Co., Cincinnati, Ohio 38
Laflin & Rand Powder Co., 29 Murray, N. Y. 45
Guns, Pistols, &c.
Hibbard, Spencer, Bartlett & Co., Chica. 22
Hammers.
Buffalo Hammer Co., Buffalo, N. Y. 37
Hammers, Steam.
Beaudry & Cunningham, Boston, Mass. .. 56
Bradley & Co., Syracuse, N. Y. 56
Hand Force Pumps.
Union Mfg. Co., 103 Chambers, N. Y. 7
Hardware Comm'n Merchants.
Field Alfred & Co., 93 Chambers, N. Y. .. 10
Graham J. H. & Co., 113 Chambers, N. Y. .. 8
Haines Samuel A. 88 Chambers, N. Y. 12
Hardware Importers.
Field Alfred & Co., 93 Chambers, N. Y. 10
Hardware Manufacturers.
Duggan-Parker Hardware Mfg. Co., St. Louis, Mo 30
Enterprise Mfg. Co., Philadelphia 50
Stanley Works, New Britain, Conn. 51
Union Mfg. Co., 103 Chambers, N. Y. 7
Hardware Mfrs.' Agents.
Jacobus W. H. & Co., 90 Chambers, N. Y. 48
Hardware Shelf Boxes.
Green S. H., 22 Park Place, N. Y. 34
Jones Jesse & Co., Philadelphia, Pa. 48
Hardware Specialties.
Acme Shear Co., Bridgeport, Conn. 10
Campbell John, Manchester, N. H. 46
Hibbard, Spencer, Bartlett & Co., Chicago, Ill. 22
Manhattan Hdw. Co., Reading, Pa. 52
Rex A. C. & Co., Philadelphia, Pa. 18
Saxton & Osgood, Buffalo, N. Y. 56
The Hatch Bros. Co., Bridgeport, Conn. .. 37
The Wire Goods Co., Worcester, Mass. 14
Underhill, Clinch & Co., 91 Chambers N. Y. 10
Union Hdw. Co., Torrington, Conn. 41
Hardware, Theatrical.
Martin Samuel, 127 Eighth av., N. Y. 16
Harness Snaps.
Covert Mfg. Co., West Troy, N. Y. 18
Hay Carriers.
Myers F. E. & Bro., Ashland, O. 46
Hay Knives.
Hiram Holt & Co., East Wilton, Me. 8
North Wayne Tool Co., Hallowell, Me. 53
Hinges.
Stanley Works, New Britain, Conn. 51
Union Mfg. Co. 103 Chambers, N. Y. 7
Hog Ringers.
Blair E., Bucyrus, O. 9
Chambers, Bering & Quinlan Co., Decatur 4
Hoisting Machines.
Box Alfred & Co., 314 Green, Phila 53
Harrington E., Son & Co., Philadelphia .. 55
Morse, Williams & Co., Philadelphia, Pa. 55
Sellers Wm. & Co., Philadelphia, and 79 Liberty st., N. Y. 55
Stokes & Parrish Machine Co., Phila., Pa. 54
Hooks (Cotton & Bale).
New York Handle & Mallet Works, 456 E. Houston, N. Y. 13
Horse Nails, *Makers of.*
Champion Horse Nail Co., Appleton, Wis. 55
Essex Horse Nail Co., Essex, N. Y. 47
Livingston Horse Nail Co., 104 Reade, N. Y. 36
National Horse Nail Co. Vergennes, Vt. .. 30
Horse Rasps and Files.
Heller & Bro., Newark, N. J. 8
Horse Shoes, *Makers of.*
Rhode Island Horse Shoe Co., Providence. 44
The Burden Iron Co., Troy, N. Y. 4
Hose and Pipe Couplings.
Cand, Harmer & Co., Philadelphia, Pa. .. 50
Hose Carriages.
Jacobs E. H. & Co., Danielsonville, Conn. 31
Hot-Blast Stoves.
Witherow James P., Pittsburgh, Pa. 40
Household Articles.
Tucker & Dorsey Mfg. Co., Indianapolis .. 47
Hydrants, &c.
McLean John, 296 & 298 Monroe, N. Y. 12
Hydraulic Jacks.
Dudgeon Richard, 24 Columbia, N. Y. 10
McCoy & Sanders, 26 Warren, N. Y. 14
Watson & Stillman, 204 E. 43d, N. Y. 55
Ice-Cream Freezers.
American Machine Co., Philadelphia 38
White Mountain Freezer Co., Nashua 31
Ice Grips.
Little Giant Ice Grip Co., Phila., Pa. 16
Insurance, Boiler.
Hartford Steam Boiler Inspection & Insurance Co. 46
Iron, *Manufacturers' Agents.*
Cox Justice, Jr., & Co., 333 Walnut, Phil. .. 5
Hicks & Dickey, Philadelphia, Pa. 5
Hoffman J. W. & Co., 208 S. 4th, Phila. 4
Levis Henry & Co., Philadelphia, Pa. 5
Iron, *Manufacturers of.*
Alan Wood Co., Philadelphia 5
Burden Iron Co., Troy, N. Y. 4
Burgess Steel and Iron Works, Portsmouth, O. 12
Kirkpatrick & Co., Pittsburgh, Pa. 4
Leonard John, 451 West st., N. Y. 4
Moorhead & Co., Pittsburgh, Pa 6
Montour Iron & Steel Co., Danville, Pa. .. 48
Phœnix Iron Co., 410 Walnut, Phila. 5
Plymouth Rolling Mill Co., Conshohocken, Pa. 5
Portage Iron Co., Limited, Duncansville, Pa. 2
Pottsville Iron & Steel Co., Pottsville, Pa. 30
Riverside Iron Works, Wheeling, W. Va. 45
Sternbergh J. H., Reading, Pa. 4
The Passaic Rolling Mill Co., Paterson 4
The Wilmot & Hobbs Mfg. Co., Bridgeport. 34
Troy Steel and Iron Co., Troy, N. Y. 48
Tyrone Iron Co., Tyrone Forges, Pa. 6
Whitney A. R. & Co., 58 Hudson, N. Y. 4
Iron and Steel, Swedish.
Lewander & Co., Boston, Mass. 49
Iron Brokers.
Etting Edward J., Philadelphia, Pa. 5
Fox John, 160 Broadway, N. Y. 4
Walbaum W. H., Philadelphia, Pa. 5
Iron Commission Merchants.
Haines Samuel A., 88 Chambers, N. Y. 12
Hart Wm. R. & Co., Philadelphia, Pa. 5
John L. Hogan, Philadelphia, Pa. 5
Lea J. Tatnall & Co., Philadelphia 5
Lundberg Gustaf, Boston, Mass. 49
Mohr J. J., 430 Walnut, Philadelphia 5
Wister L. & R. & Co. Philadelphia, Pa 5
Iron Dealers.
Abeel Brothers, 190 South, N. Y. 4
Abbott Jere & Co., N. Y. and Boston 49
Bonnell, Botsford & Co., Youngstown 4
Borden & Lovell, 70 and 71 West, N. Y. 4
Cooney Daniel F., 88 Washington, N. Y. .. 4
Cox Justice, Jr., & Co., Philadelphia 5
Esherick & Co., Philadelphia, Pa 5
Hart, Wm. R. & Co., Philadelphia 5
Himrod Chas. & Co., Chicago, Ill. 4
Hoffman J. W. & Co., 208 S. Fourth, Phil. 5
Judson B. F., 457 and 459 Water, N. Y. 4
Keeley Jerome & Co., Philadelphia, Pa. .. 5
Lindsay & Parvin, Philadelphia 5
Lundberg Gustaf, 38 Kilby, Boston 49
Lundell Chas. G., Boston, Mass. 49
Naylor & Co., 99 John, N. Y. 48
Ogden & Wallace, 85 to 91 Elm, N. Y. 4
Pierson & Co., 24 to 27 West, N. Y. 4
Pullman J. Wesley, Philadelphia 5
Wallace Wm. H. & Co., Albany & Washington streets, N. Y. 4
Wilson E. H. & Co., Philadelphia, Pa. 5
Whitney A. R. & Co., 17 Broadway, N. Y. 4
Iron Founders.
Hannan, Fras. B. Pottsville, Pa. 4
Iron Pig, *Importers of*
Abbott Jere & Co. (Swedish), New York & Boston 39
Page, Newell & Co., Boston, Mass. 39
Williamson James & Co., 63 Wall, N. Y. .. 4
Iron Planers.
Brettel Geo. E. Rochester, N. Y. 53
Iron, Sheet, *Manufacturers of*
Alan Wood Co., Philadelphia, Pa. 37
Everson, Hammond & Orr, Pittsburgh, Pa 4
Lefferts, Marshall & Co., 90 Beekman, N. Y 4
Standard Iron Co., Bridgeport, O. 48
W. D. Wood & Co., Limited, Pittsburgh 4
Iron, Steel and Nails.
Morris, Wheeler & Co., 14 Cliff, N. Y. 5
Ironwork, Ornamental.
Champion Iron Fence Co., Kenton, O 46
The Fred. J. Myers Mfg. Co., Covington, Ky 3
Jacks.
Poor & Woulf, Black River, N. Y. 51
Key Blanks.
Eagle Lock Co., 98 Chambers, N. Y. 16
Keys.
Wollensak, J. T., Chicago, Ill. 37
Lacquer.
H. S. Allen & Co., 112 John, N. Y. 3
Lanterns.
Romer & Co., Newark, N. J. 40
Lathes.
Harrington, E. & Son, Philadelphia 55
Prybil P., 467 W. 40th, N. Y. 52
Sebastian, May & Co., Cincinnati, O. 34
Lawn Mowers.
Blair Mfg. Co., Springfield, Mass. 49
Chadborne & Coldwell Mfg. Co., Newburg, N. Y. 10
Haines S. A. & Co., 88 Chambers, N. Y. 12
Lloyd & Supplee Hdw. Co., Philada. 41
Mast, Foos & Co., Springfield, O. 37
Lead Pipe Cutters.
R. T. Sollis & Co., Brockton, Mass. 2
Lemon Drills.
Moulton W. F., Burlington, Vt. 36
Lemon Squeezers.
Ripley Mfg. Co., Unionville, Conn. 48
Levels.
Richardson C. F., Athol, Mass. 40
Locks and Knobs, *Manufacturers of.*
Dietz A. E., 97 Chambers, N. Y. 30
Eagle Lock Co., 98 Chambers N. Y. 16
Manhattan Hdw. Co., Reading, Pa. 52
Smith & Egge Mfg. Co., Bridgeport 40
J. E. Quackenbush & Sons, 535 Eighth av., N. Y. 37
Stoddard Lock Co., Saybrook, Conn. 6
The Charles Parker Co., Meriden 46
Yale & Towne Mfg. Co., Stamford, Conn. 11
Locomotive Cylinder Boring Machines.
L. B. Flanders Machine Co., Philadelphia. 36
Machinery.
Adt John & Son, New Haven, Conn. 53
Barker Wm. & Co., Cincinnati, Ohio 54
Barnes W. F. & John, Rockford, Ill. 54
Brettel, Geo. E., Rochester, N. Y. 53
Deming F., Waterbury, Conn 30
Dickson Mfg. Co., Scranton and Wilkesbarre, Pa. 55
Garvin E. E. & Co., 139 Centre, N. Y. 54
Harrington E & Son, Philadelphia 55
Hendy Machine Co. Torrington, Conn. .. 53
Lodge, Davis & Co., Cincinnati, O. 55
Pittsburgh Mfg. Co., Pittsburgh, Pa. 53
Sellers Wm. & Co., Philadelphia, and 79 Liberty, N. Y. 55
Southwark Foundry and Machine Co., Philadelphia, Pa. 55
Stokes & Parrish Machine Co., Philadelphia, Pa. 54
Stow Flexible Shaft Co., Ld., Phila. 55
The Stiles & Parker Press Co., Middletown, Conn. 56
Union Foundry & Pullman Car Wheel Works, Chicago, Ill. 8
Waterbury Farrel Foundry and Machine Co., Waterbury, Conn 46
Wetherill Robert & Co., Chester, Pa. 55
Woodward & Rogers, Hartford, Conn. 16
Machinists' Scales.
Coffin & Leighton, Syracuse, N. Y. 13
Machinists' Tools and Supplies.
Blaisdell P. & Co., Worcester, Mass. 53
Brettell Geo. E., Rochester, N. Y. 53
Harrington E., Son & Co., Philadelphia, Pa. 55
King J. M. & Co., Waterford, N. Y. 8
Sellers Wm. & Co., Philadelphia, and 79 Liberty, N. Y. 55
Malleable Iron Castings.
Woodruff, Miller & Co., Mt. Carmel, Ct. .. 15
Mallets.
N. Y. Handle & Mallet Works, 456 E. Houston 13
Penfield Block Co., Lockport, N. Y. 14
Measuring Faucets.
Lane Bros., Poughkeepsie, N. Y. 50
Measuring Tapes.
Eddy Geo M. & Co., 352 Classon av., Brooklyn 6
Mercantile Agencies.
John W. Ealy Co., 265-267 B'dway, N. Y. 16
Metals.
Dickerson, Van Dusen & Co., 29 and 31 Cliff, N. Y. 2
Naylor & Co., 99 John, N. Y. 48
Phelps, Dodge & Co., Cliff st., N. Y. 2
Phosphor Bronze Smelting Co., Limited, 512 Arch, Philadelphia 13
Metallurgists.
Booth, Garrett & Blair, 919 Chant, Phila. .. 5
Britton J. Blodgett, 330 Walnut, Phila. .. 48
Salom & Westesson, Philadelphia 5
Mills, Bone Grinding.
Wilson Bros., Easton, Pa. 49
Mine Lamps.
Hunt & Connell, Scranton, Pa. 12
Leonard Bros., Scranton 12
Mineral Wool.
Western Mineral Wool Co., Cleveland .. 45
Mining Engineers.
Brainerd A. F., Birm'ngham, Ala. 14
Mining Machinery.
MacLanahan & Stone, Hollidaysburg, Pa. 4
Miter Boxes.
Olmsted L. H., Corona, N. J. 16
Molding Machines.
Aiken & Lighton, Birmingham, Ala. 50
Molding Sand.
Paxson J. W. & Co., 514 Beach, Phila. 5
Mouse Traps.
Kendall J. B., Washington, D. C. 38
Lovell Mfg. Co., Erie, Pa 49
Ripley Mfg. Co., Unionville, Conn. 48
Nail Machinery.
American Nail Machine Co., Ashtabula Ohio 53
Birmingham Iron Foundry, Birmingham, Conn. 3
Pittsburgh Mfg. Co., Pittsburgh, Pa. 53
Nails.
Borden & Lovell, 70 West, N. Y. 4
E. & G. Brooke Iron Co., Birdsboro 7
Cumberland Nail & Iron Co, Phila. 5
Fuller Bros. & Co., 139 Greenwich, N. Y. 4
Oxford Iron Co., 81 Washington, N. Y. 4
Riverside Iron Works, Wheeling, W. Va. 45
Stebbins C. J., 111 Reade, N. Y. 4
Virginia Nail and Iron Works Co., Lynchburg, Va. 14
Nails, Cut.
Blankenship R. E., Richmond, Va. 7
Borden & Lovell, 70 West, N. Y. 4
Nickel Platers' Supplies.
Hanson, Van Winkle & Co., Newark, N. J. 47
The Zucker & Levett Chemical Co., 540 to 544 West 16th, N. Y. 33
Norway Shapes, *Rollers of.*
Naylor & Co., 99, John, N. Y. 48
Rowland William & Harvey, Frankford, Philadelphia 56
Nuts, Bolts, &c., *Makers of.*
American Bolt Co., Lowell, Mass. 43
Port Chester Bolt and Nut Co., Port Chester, N. Y. 37
The Allentown Rolling Mills, Allentown. 5
Wm. H. Haskell Co., Pawtucket, R. I. 53
Russell, Burdsall & Ward, Port Chester .. 56
Oilers.
Hero Fruit Jar Co., Philadelphia, Pa. 14
Oil Stones.
Chase Geo. 107th & Harlem River, N. Y. .. 47
Ox Muzzles.
Brower John, 81 Murray, N. Y. 4
Ox Shoes.
Millers Falls Co., 74 Chambers, N. Y. 30
Woodruff, Miller & Co., Mount Carmel, Conn. 15
Packing.
Chalmers-Spence Co., 419 Eighth, N. Y. .. 9
N. Y. Belting and Packing Co., 13 and 15 Park Row, N. Y. 13
Padlocks.
Eagle Lock Co., 98 Chambers, N. Y. 16
Romer & Co., Newark, N. J 40
Penn Lock Works, Philadelphia 38
Smith & Egge Mfg. Co., Bridgeport 40
Patent Solicitors.
Globe Patent Office, 34 Park row, N. Y. .. 49
Howson & Son, Phila. and Washington .. 11
Stetson Thos. D., 23 Murray, N. Y. 46
Stocking E. R., Washington, D. C. 13
Perforated Metal.
Harrington & King Perforating Co., Chicago, Ill. 39
Phosphor Bronze.
Phosphor Bronze Smelting Co., Limited, 512 Arch, Philadelphia 3
Picks, *Makers of.*
Pierson & Co., 24 Broadway, N. Y. 4
Pig Iron.
Hart Wm. R. & Co., Philadelphia, Pa. 5
Montour Iron and Steel Co., Reading, Pa. 48
Springfield Fdry. Co., Springfield, Mass. .. 10
Pipe Cutters.
Pancoast & Maule, Philadelphia 46
Pipes, Fittings, &c., *Makers of,*
McNab & Harlin Mfg. Co., 56 John, N. Y. .. 53
Pipe, Water and Gas, *Makers of.*
Fox John, 160 Broadway, N. Y. 4
Reading Iron Works, Philadelphia, Pa. .. 6
Sayre Pipe Foundry, Sayre, Pa. 44
Wood R. D. & Co., 400 Chestnut, Phila. 4
Wyckoff A. & Son, Elmira, N. Y. 13
Plane Irons, *Manufacturers of.*
Buck Bros., Millbury, Mass. 13
Planes, *Manufacturers of.*
Stanley Rule & Level Co., 29 Chambers, N. Y. 9
Planes, Iron.
Meriden Malleable Iron Co., Meriden, Conn. 14
Tower & Lyon, 95 Chambers, N. Y. 47
Plated Ware.
Hall, Elton & Co., 47 E. 13th, N. Y. 11
Rogers & Hamilton, Waterbury, Conn. 9
Simpson, Hall, Miller & Co., Wallingford, Conn. 46
Platers' Supplies.
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Rooms 16, 17, and 18 Bissell Block. Pittsburgh, Pa.

To Iron and Nail Mills.

I want agency for St. Louis and tributary trade, on commission, of a B. Bar and Sheet Mill; a C. C. Bar and Plate Mill; a Steel Plate Mill and a Nail Mill. Water transportation here preferred. Ten years' acquaintance with trade, and satisfactory references. Am here to stay, and want permanent agency.
Address W. C. KENNEDY,
1110 Pine St., St. Louis, Mo.

FOR SALE.—An old and well-established Hardware business in one of the best locations in Kansas City, Mo. For further particulars, address "NAILS," Box 22,

Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

WANTED—By Chicago party representing an Eastern house who manufacture a building specialty, and calling on Architects and Hardware Dealers, one other line to handle in connection with present line. Only articles of merit will be considered. A No. 1 references.
Address GEO. E. WILLIAMS,
Room 77, Honore Building, Chicago.

HARDWARE.—Situation wanted by a man who has had twenty years' experience and is capable of taking charge of a store. Unquestionable references in regard to honesty, ability, &c.
Address "BUSINESS,"
Office of *The Iron Age*, 66 and 68 Duane St., New York.

Business Opportunity.

To increase their working capital, a well-established manufacturing company engaged in the construction of all kinds of Wrought and Plate Iron structures desire to obtain $10,000. To a first-class business man willing to make such an investment, after an examination of the property and business, they offer the position of Secretary and Treasurer and the financial conduct of the company. For further particulars, address W. J. GILBERT,
205 N. 4th st., St. Louis, Mo.

FOR SALE.—Foundry or Factory Site at station adjoining track; 14 minutes from Liberty street, New York; plot over 16 city lots, solid ground, sewered, pipe water, gas, horse cars, convenient to ferries and railroad depots, offering unequaled facilities for shipping. JOHN H. PLATT,
150 Broadway, New York.

A good business man with $25,000 to $30,000 can secure official position in large and successful manufacturing corporation Seven per cent will be guaranteed on the investment, and a salary in proportion to services rendered. A person competent to take charge of the selling department preferred,
Address "CORPORATION,"
Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

Wanted.

Useful Hardware Specialties to manufacture on good terms, by a well-established factory and good trade.
Address "HARDWARE FACTORY,"
Office of *The Iron Age*, 4th and Main Sts., Cincinnati, O.

Wanted,

a good, sober business man for Partner, with four or five thousand dollars, to take an interest in a good manufacturing business. For further particulars, address
"BUSINESS INDUSTRY,"
Office of *The Iron Age*, 4th and Main Sts., Cincinnati, O.

Wanted,

A Hardware Clerk who is competent to act as Salesman in a wholesale and retail Hardware Store. References required. Address, stating experience and also salary expected.
P. O. BOX 578,
Hartford, Conn.

COMPRESSOR FOR SALE, CHEAP.—A Delamater Duplex 16 in. x 36 in. compressor. Has been run 18 months. Apply to
L. C. BIERWIRTH, Sec'y,
Dover, New Jersey.

WANTED.—An active partner, with ($10,000) ten thousand dollars capital, in one of the oldest stands in New England. Iron, Steel, Hardware, &c. For particulars, address
"CONSERVATIVE,"
Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

Special Notices.

FOR SALE.

Damaged Band and Rod Iron.

For sale low, or in exchange for Scrap Iron or Scrap Steel.

DAN'L W. RICHARDS & CO.,

DEALERS IN

SCRAP IRON, SCRAP STEEL AND METALS,

92 MANGIN STREET

New York.

SECOND HAND, CHEAP.

One 17 ft. bed, 30 in. Engine Lathe.
One 16 ft. " 25 in. " "
One 6 ft. bed, 18 in. Windsor Lathe and Chuck fitted.
One 6 ft. bed, 16 in. Blaisdell Lathe and Chuck fitted.
One Profiling Machine.
One No. 3 Brown & Sharpe Screw Machine.
One 2-spindle Pratt & Whitney Drill.
One 4 " Garvin "
One Pratt & Whitney Cam Cutter.
One 8-in Dudgeon Steam Hammer.
One 2-in. Pipe Threading and Cutting Machine.
Send for List of Second-hand Tools.

New York Machinery Depot,

Bridge Store No. 16, on Frankfort St.,

New York.

Manufacturing Sites

FOR SALE.—In Westmoreland County, Pa., on the Allegheny Valley R. R., 18 miles from Union Depot, Pittsburgh, in lots from 10 to 200 acres, having front ¾ of a mile on Allegheny River on west, and same length of railway on the east; is level and mostly 20 feet above highest water, sidings at various points, can connect at grade. Ten-foot vein of coal under the whole tract. Both the Philadelphia and the Hite Companies' Gas Lines from Tarentum Region are respectively 300 and 100 yards from whole west front; Gas rises along all this front, and parties desiring to control their own fuel would do well to look at this item. Railroads centering at Pittsburgh have favorable rates for all points. Two large plate glass works and other industries using gas lie from one to two miles above, on the Tarentum side. Descriptive circular sent on application to

ALEXANDER YOUNG,
Parnassus, Pa.

36-INCH PLANERS.

We are prepared to furnish a few 36 inch planers of the most approved construction at very low prices. Send for our circulars of

Pulley Lathe, Pulley Borer and Lathes,

from 26-inch to 72-inch swing.

THE

NEWARK MACHINE TOOL WORKS,

NEWARK, N. J.

FOR SALE.—The property known as the Stirling Chain Works, situated on the north side of Amherst Street, Black Rock, Buffalo, N. Y., No 250, within two minutes' walk of the Belt Line Railroad Station. The works are in perfect order for immediate operation, and possess all the machinery requisite for the manufacture of Chain from ¼ inch up to 2¾ inches Facilities for receiving and shipping are admirable. This property can very easily, cheaply and advantageously be adapted to any manufacturing business. For further particulars apply to
Messrs. JOHN OTTO & SON,
Buffalo, N. Y.
Descriptive circular sent on application.

For Sale.

A clean stock of Hardware in a live and growing Michigan town. Stock will invoice about $7000. Satisfactory reasons given for selling.
Address "GENERAL HARDWARE,"
Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

FOR SALE AT VERY LOW PRICES—Several new Engine Lathes of 16 in., 18 in., 24 in. and 28 in. swing of late design, with great power and all modern improvements. For description and prices, address J. B. REED,
Cairo, Ill.

NEW LOCATION WANTED FOR MANUFACTURING.

A manufacturing concern, long and well established, desires to make a change from a small place with no railroad to some live town of 5000 or over. The line of goods is a very fine one, and sell to the Hardware Trade. About 100 of the best class of mechanics are employed, and the number can be largely increased. This is a rare chance for some good place to secure one of the finest branches of manufacturing. Correspondence is solicited, setting forth advantages, inducements, &c.
Address "MANUFACTURER."
Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

PRICE BOOKS.

LARGE SIZE, 500 Pages, 6 x 9½ in. each, $8.00.
POCKET SIZE, 250 Pages, 4 x 7 in., each, $4.00.
Send for Circulars.

B. LAMBERSON,

PORTLAND, OREGON.

Manager Wanted

for an Anthracite Furnace; one sufficiently familiar with chemistry to analyze his own stock and products preferred. Address, stating age, experience and references,
"B,"
Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

TO LET, WITH POWER, one or more floors of a two story and basement brick building, 162 x 55 feet situated within seven minutes of freight depot and steamboat wharf.
Address
P. O. BOX 5,"
Bridgeport, Conn.

Special Notices.

Second-hand Machinery in Good Order. For Sale Cheap.

1 Engine Lathe, 48 in. x 20 ft. bed.
1 " " 36 in. x 18 ft "
1 " " 28 in. x 15 ft. "
1 " " each 24 in. x 20 in. and 24 ft
1 " " 24 in. x 12 ft. bed. Fifield
1 " " 22 in. x 12 ft
1 " " 20 in. x 8 and 10 ft. bed. Putnam.
1 " " 18 in. x 9 ft. "
1 " " 15 in. x 6 ft. Porter. Rod feed only.
2 each " " 16 in. x 6 ft. and 8 ft.
1 " " 14 in. x 6 ft.
1 " " 12 in. x 5 ft.
3 " " 13 in. x 5 ft. Wm. Sellers & Co.
2 each " " 11 in. x 4 and 5 ft
1 Planer.
1 " 17 in. x 17 in. x 3¼ ft.
1 " 20 in. x 20 in. x 4 and 5 ft.
1 " 36 in. x 36 in. x 7 ft.
1 " 30 in. x 30 in. x 8 ft.
1 " 24 in. x 24 in. x 5 and 6 ft.
1 " each 42 in. x 42 in. and 9 and 10 ft.
1 Shaper, 10-in. stroke. Pratt & Whitney.
1 Shaper each 12, 15, 20 and 28 in. stroke.
1 Crank Planer.
1 32-in. B. G. & S. F. Drill.
1 each Upright Drill, 20 and 24 in., with Back Gears.
1 Lincoln Pat. No 2 Miller.
1 Index Miller. Pond.
1 each 3, 6 Spindles, No. 0 Drills. P. & W. Co.
1 each Nos 1 and 2 Screw Machines. Wire Feed. Pratt & Whitney.
1 No. 3 Screw Machine. Plain. P. & W.
1 375-lb. Drop Hammer. Beecher & Peck
1 No. 20 Bliss Press.
10 Foot Presses, assorted.
8 Power " "
12 Punching and Shearing Machines, assorted.
2 Return Tubular Boilers, 15 H.-P.
1 Vertical Boiler, 25 H.-P.
2 Hoisting Engines, 8 and 10 H.-P.
1 Small Hand Miller.
1 Horizontal Engine, each 25 and 45 H.-P.
1 Vertical Engine, 10 H.-P.
1 Die Sinking Machine.
1 48-in Boring and Turning Mill. Pond.
1 40-lb. Bradley Hammer.
1 12-in. Shaper, 2 Tables. Betts.
1 No. 6 Root Blower.
1 Suspension Drill.
1 each 150 and 400-lb. Steam Hammers. Morgan & Williams.
1 Rogers' Wood Planer, 24 in. x 5 in.

Also full line of New Machinery.
New York Agency TAYLOR MFG. CO., Engines, Boilers, &c. Correspondence solicited.
PRENTISS TOOL AND SUPPLY CO.,
P. O. Box 3362, No. 42 Dey St., New York City.

A Patented Riveting Machine For Sale

BY STATES OR TERRITORIES.

Capable of riveting from No. 18 Wire to ⅝ inch Iron; will make any shaped head (flush or raised), and tight or loose joints.

For particulars, apply to

THOMAS MORTON,

65 ELIZABETH ST., NEW YORK.

For Sale.

Foundry, 100 x 40 ft. and Machine Shop 60 x 30 ft., both with water privilege; also Japan and Packing House 62 x 22, Stove Storehouse 30 x 14 and Storehouse and Box Shop 30 x 20. All in good repair and running order; five minutes from steamboat and ten minutes from two railroad stations. Address

WILLIAM KEIGHLEY'S EST.,
Middle Haddam, Conn.

FOR SALE.

6284 feet of 2¼-inch Cold-Rolled Shafting
592 Hangers.
300 Couplings.
577 feet of 3-inch Cold-Rolled Shafting.
53 Hangers.
25 Couplings.
1583 feet of 4-inch Cold-Rolled Shafting.
94 Pillow Blocks.
97 Couplings.
392 feet of 5-inch Cold-Rolled Shafting.
28 Pillow Blocks.
70 Couplings.

All cold-rolled and in first-class condition, having been but little used at the late Exposition, at very low prices.
SHAKSPEARE, SMITH & CO.,
No. 210 Girod St., New Orleans, La.

FOR SALE.

2300 lbs. 9 in. x 3-16 in. Best Norway Iron. Will sell low. Lot left after finishing a contract. Bars about 4 to 5 feet long.

BEECHER & PECK,
New Haven, Conn.

Manufacturers of Hardware, Iron, &c.,

Wishing to be represented in Chicago by resident Agents, with permanent office and sample room and experienced traveler for the Western Territory, the best of references,
Address "RESIDENT AGENTS,"
Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

Cash Advances Upon Iron.

PENNSYLVANIA WAREHOUSING AND SAFE DEPOSIT CO.,

Girard Building, 3d St., below Chestnut, Philadelphia.

This Company is prepared to establish yards throughout the iron regions at small cost, and to make advances at moderate rates of interest.

F. R. PEMBERTON, *President.*
JOHN MASON, Jr., *Treas. and Secy.*
GEO. H. EARLE, Jr., *Solicitor.*

Directors.—Clayton French John H. Converse, John H. Catherwood, George T. Lewis, John W. Hoffman, Edmund H. McCullough, F. R. Pemberton.

Wanted to Buy

Iron and Steel Scrap of all descriptions, such as Old Iron and Steel Wire Rope, Burnt and Malleable Iron Rails, &c., &c.

We have for sale Pig Iron, Merchant Bar Iron, Sheet Iron. Nails, &c.

SITES, GILL & CO.,
222 and 224 So. Third Street,
Philadelphia, Pa.

Dissolution of Co-Partnership.

The firm of Jackson & Tyler, Baltimore, have dissolved by limitation, June 15, 1886. The *Machinery, Tool and Supply* business will be continued by C. L. Jackson & Co., as successors to Jackson & Tyler and have removed to No. 54 German Street Baltimore, Md. Prices, lists and estimates furnished on Machinery, Engines and Supplies of all kinds.

WANTED, by a man of several years' experience, a position as Roller on either bar or guide mill. Good references. Address
"AVIGNON,"
Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

Special Notices.

MACHINERY, SECOND-HAND AND NEW, ON HAND.

16 in. x 42 in. Planer. Bridgeport. New.
18 in. x 3 ft. " Wheeler. Good.
20 in. x 4 ft. " New Haven. Good.
20 in. x 6 ft. " Pratt & Whitney. Good.
24 in. x 4 ft. " Thayer & H. Good.
24 in. x 6 ft. " Powell. New.
24 in. x 7 ft. " Ames. New.
26 in. x 6 ft. " Putnam. Good.
26 in. x 6 and 8 ft. Planers. Powell. New.
32 in. x 10 ft. " Pond. Nearly new.
34 in. x 10 ft. " P. & W. Nearly new.
12 in. x 5 ft. Engine Lathe.
14 in. x 5¼ ft. " Harris. Good.
15 in. x 6 ft. " Wood & Light. Good.
15 in. x 7 ft. " Pond. Good.
16 in. x 6 ft. " Ames. Good.
16 in. x 6 ft. " Blaisdell. New.
16 in. x 8¼ ft. " New Haven. A 1.
18 in. x 9 ft. " Belden. A 1.
18 in. x 12 ft. " Wright & Smith.
19 in. x 10, 12 and 14 ft. Engine Lathes. Pond. Nearly new.
20 in. x 10 ft. Engine Lathe. Blaisdell & Harris.
20 in. x 12 ft. " Harrisburg. Fair.
32 in. x 10 ft. " Pond. Nearly new.
34 in. x 12 ft. " Harrisburg.
30 in. Upright Drill, Back Geared and S. F. Pond. Nearly new.
26 in. Upright Drill, Bk. Geared and S. F. New Haven.
20 in. " Plain. Prentice.
12 in. stroke Sellers' Traveling Head Shaper.
24 in Shaper. Hendey. A 1.
15 in. and 24 in. Shapers. Wolcott. New. 10, 15, 20 in. Shapers. G. & Eberhardt.
Pratt & Whitney Die Sinking Machine. New.
Lincoln Pattern Milling Machine.
Lincoln Pattern No. 3 Milling Machine. New.
Pond Index Milling Machine. A 1.
Nos. 2, 3½ and 4 Stiles Presses.
Nos. 21 Bliss Press.
No. 3 Double Crank Stiles Press.
No. 6 Wilder 20-in. Punch Press.
30-in. Bliss Squaring Shear. Foot Power. A 1.
36-in. " " " Power. Extra Heavy. A 1.
25, 40 and 100 lb. Bradley Hammers.
Two Kingsley Axle Hammers.
Two Bradley Forges, No. 2. A 1.
60-in. Vertical Boring and Turning Mill. A 1.
72-in. " " " " 2 Heads. New.

If you do not see what you want, write and specify just what is required. We have other machines not enumerated above.

E. P. BULLARD,
14 Dey Street, N. Y.

SCRAP IRON.

We buy all kinds of Iron and Stee Scrap, Burnt Iron, Old Rails, &c., &c. Write us, naming quantity, price, &c.

ROBINSON & ORR,
115 Water St., Pittsburgh, Pa.
(Established 1859.)

SCRAP IRON.

We buy and sell all descriptions of Iron and Steel Scrap. Correspondence solicited.

HOFFMAN, PARRY & CO.,
208 S Fourth St., Philadelphia.

IRON AND STEEL SCRAP

Bought and Sold.

JAMES H. LOGAN,

Pig Iron Commission Merchant,

93 Fourth Ave., - - PITTSBURGH, PA.

SCRAP IRON.

We buy all classes of Iron and Steel Scrap, Wrought Turnings, Cast Borings, Burnt Metal, &c

GEO. A. McLEAN & CO.,
Room 28, Lewis Block, P. O. Box 455,
Pittsburgh, Pa.

NOTICE.

We buy and sell all classes of Iron and Stee Scrap. Correspondence solicited.

JOS. C. POULTERER & CO.,
204 S. Third St., Philadelphia

Cotton Gin Ribs.

HARDWARE MERCHANTS

and others furnished with materials of all kinds for making and repairing COTTON GINS. RIBS and SAWS for repairing ALL makes of gins. Send for Price List. Address THE BROWN COTTON GIN CO., Manufacturers of Cotton Gins, Feeders and Condensers, New London, Conn.

FOR SALE.

PLANT FOR STEEL AND IRON FORGINGS
Steam Hammers, Engine, Boiler, &c.
ROOT BLOWERS, Nos. 1, 2, 4, 5 and 7.
STURTEVANT BLOWERS. Nos 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10. Engines, Boilers, Pumps, Tanks, Rolls, and General Machinery. Careful attention given to purchasing for parties out of the city. Correspondence solicited. C. R. BIGELOW, M. E.,
45 Dey St., New York City

FOR SALE.

Three-Spindle Nut Tapper. Hoop Iron Testing Machine, Column Milling Machine. 16 in. x 8 ft Lathe, Small Slotter, Ames Gear Cutter, two Bolt Cutters.

A. G. BROOKS,

261 North Third Street, - Philadelphia.

FOR SALE.

One Plain Cylinder Boiler, 30 ft. long, 30 in. diameter, with Steam Dome and Safety Valve, and the Castings necessary to set it up, all in good condition; one Horizontal Engine, plain slide valve, cylinder 8 in. diameter, 16 inches stroke, with fly-wheel and belt pulley; one Abbe Patent Bolt Forging Machine, used only a few weeks; two Chapin Bolt Heading Machines, in good order; one Bruso Track Bolt Heading Machine; one small Heading Machine, adapted to head 7-16 and smaller rods; one small Knowles Steam Pump; one Three-Spindle Geared Nut Tapper.
J. H. STERNBERGH, Reading, Pa.

Hoisting Engines and Elevators.

New 10 H.-P. worm-geared Hoisting Engines; Steam Cylinder 6 in. bore, 8 in. stroke; geared 16 to 1; Drum 20 in. diameter, 18 in. long; improved Cone Friction for Hoisting and Lowering. Same style, *double cylinders*, 20 H.-P.
Warehouse Elevators. All attachments.

A. G. BROOKS,
261 N. Third Street, Phila.

Basic and Bessemer Steel Ores

We have many thousands of acres of the finest Basic and Bessemer Steel Ores for sale on lines of railroads, with limestone in abundance close by, and coal for coking not very distant; also manganese and many good farms.

MOON & RENICK,
No. 11 Tenth St., Richmond, Va.

HARDWARE Travelers in United States and Canada may hear of a commission to sell the Patent New York Hasp Lock and Catch combined.

NEW YORK HASP LOCK WORKS,
72 Reade Street, New York.

Trade Report.

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, June 30, 1886.

Scotch Pig.—Market quiet; nothing of importance to note. We make slight changes in last week's quotations, as follows:

Coltness, alongside, Glasgow		47/
Langloan,	" "	43/
Gartsherrie,	" "	43/
Summerlee,	" "	46/
Carnbroe,	" "	42/
Glengarnock,	" Ardrossan	42/6
Eglinton,	" "	39/6
Dalmellington,	" "	40/6
Shotts,	" at Leith	44/

Carriage from Ardrossan to Glasgow is 1/ ₱ ton.

Cleveland Pig.—Market dull and uninteresting; no change in prices, which we quote as follows, f.o.b. shipping ports:

Middlesboro', No. 1 Foundry	32/6
" No. 2 "	31/9
" No. 3 "	30 @ 30/6
" No. 4 Forge	29/6

Bessemer Pig—The market shows no activity, and the stereotyped "no change" represents the actual condition of the market. We repeat last week's quotations, as follows: W. C. Hematites, 42/ for mixed lots, Nos. 1, 2 and 3, equal portions, f.o.b. shipping ports.

Manufactured Iron.—The market is without change of any kind, and quotations remain the same, viz.:

		£	s.	d.		£	s.	d.
Staff. Ord.	Marked Bars	7	0	0	@	7	10	0
"	Medium "	5	10	0	@	6	0	0
"	Common "	4	17	6	@	5	5	0
Hoops, 20 W. G. and over.								
"	Common Best	6	15	0	@			
"	Medium	6	0	0	@	6	10	0
"	Common	5	5	0	@	5	15	0
Sheets, 20 W. G. and under.								
"	Ordinary Best	7	5	0	@	8	0	0
	Common	6	5	0	@	7	0	0

Steel Rails.—The market remains steady at last week's quotations, viz.: £3. 7/6 @ £3. 10/, f.o.b. shipping ports.

Old Rails.—The market is lower, and may be quoted 5/ below last week's price, viz.: Old D. H.'s, c.i.f. New York, 55/.

Scrap.—No feature of interest to report in this market, which remains as noted last week, with prices unchanged, viz.: Heavy Wrought, 50/; Bessemer Crop Ends, run of mill, 54/ @ 56/, c.i.f. New York.

Copper.—The market is a little firmer. Chili Bars quoted £39. 10/ @ £40, and Best Selected £43. 10/ @ £44.

Tin.—The market is not so steady. Straits Tin, spot, £101. 10/ @ £102, and futures £102 @ £102. 10/.

Tin Plates.—The market is a little steadier, and may be quoted as follows:

Tin Plates, 10x14, 1st qual.	Charcoal	18/	@ 19/
" " 2d	"	16/	@ 17/6
" " 1st	" Coke	15/	@ 15/6
" " 2d	"	13/6	@ 14/

Spelter.—The market is not so steady, and may be quoted slightly lower, viz.: Ordinary at shipping ports, £13. 15/ @ £14.

Lead.—The market is a little higher, and we revise quotations accordingly, viz.: Common English Pig, £13. 15/ @ £14.

Freights.—Steam from Glasgow to New York, 5/.

Financial.

Office of *The Iron Age*,
WEDNESDAY EVENING, June 30, 1886.

The "depression of industry" is ascertained to be only a relative term, and in the sense now commonly used has little significance aside from the fact that profits are low. And this is true whether reference be had either to the mechanical and agricultural or the mercantile departments of activity. Our agricultural resources are indicative of prosperity, the forthcoming crops of wheat and cotton affording every assurance of abundance. The promised surplus of wheat available for export is put down at 130,000,000 bushels. The condition of labor as represented by the various trades improves from week to week. The violence exhibited by the Lake Shore switchmen can have no other effect than to demonstrate the supremacy of the law and its efficacy as a final resort where great interests antagonize.

The stock markets have been irregular and generally lower. Lake Shore fell on reports of the switchmen's strike, and other stocks were affected. On Friday coal shares were more active on rumors of an intended advance in the price of coal, and there was an active demand for grangers by operators in Chicago. On Saturday the Lake Shore strike and gold exports tended to depression. On Monday there was continued dullness, the heavy tone assisted by further engagements of gold for export, and on Tuesday prices were still unsettled.

Bar silver has taken another tumble to 44¼d. ₱ ounce. One June 19 nearly $182,000,000,000 were in the United States Treasury.

On 'Change business is moderately active, with valuations but slightly changed compared with a week ago. The closing price for June options is 84½¢, as compared with 84¼¢ a week ago. Purchases for export are light. All kinds of provisions have ruled firmer. India-rubber is firm. Raw sugar strong and active. Cotton is advanced, but easy. Coffee and wool firm. Dry goods jobbers report a steady growth and wide demand since the middle of May

The weekly bank statement shows a decrease of $1,357,150 in surplus reserve, which now stands at $14,354,275, against $63,694,425 at the same time last year, and $13,000,000 at the corresponding date in 1884. The loans are expanded $3,672,000. Currency is returning from the West less freely. Commercial paper is in good supply. We quote 60 @ 90 days' indorsed bills receivable 3¼ @ 4 %. The July disbursements in New York for dividends and interest are estimated at nearly $60,000,000, at Philadelphia upward of $11,000,000, and in Boston over $10,000,000, materially augmenting the supply of loanable funds. There have been further shipments of gold to Europe, the total export this week amounting to about $2,500,000. It is presumed that these shipments are destined to Berlin. The new Russian loan, which is soon to be brought out there, is for the equivalent of $50,000,000, and in anticipation of it Berlin has been drawing gold from Paris. It is said at the Treasury Department that the public debt statement for June will show a reduction for the month of about $10,000,000.

The Clearing-House exchanges reported from 30 cities indicate continued activity in business circles, the gain compared with last year being 35 6 %, as compared with 34.9 % the previous week. Outside of New York the gain is 22 %. The business failures reported to *Bradstreet's* are less than for the previous week. The total failures in the United States from January 1 to June 24 are 5278, against 6065 in 25 weeks of 1885. Sterling exchange is dull at 4.88¾¢ @ 4.90¢.

The Randall tariff bill, according to computations in the Treasury Department, will reduce the revenue nearly $35,000,000. Among the items are tin plates, reduced from $5,055,590 to $1,000,000; iron and steel rivets and wire rods, lighter than No. 5, from $644,915 to $250,000; cotton ties, from $162,744 to $62,000; pig lead, from $29,158 to $21,869. Any definate action at this session is considered improbable.

The House by an almost unanimous vote put an amendment into the Sundry Civil bill, directing the Secretary of the Treasury to issue certificates of the denomination of $1, $2 and $5 on all surplus silver dollars now in the Treasury in payment of appropriations made in the bill and other expenditures and obligations of the Government. A correspondent in Washington says the amendment may be rejected, although the prospect of an issue of $1 and $2 paper money to the amount of $90,000,000 at once and $2,000,000 every month afterward is very attractive to certain members in view of the intention of the Treasurer to issue no more $1 and $2 greenbacks.

The imports of merchandise at this port during the week were $1,000,000 above those of the previous week, the total valuation being $8,225,794, making the aggregate since January 1 $208,875,071, as compared with $187,432,034 for the same time in 1885, and $222,331,202 in 1884. The exports of merchandise for the week were $1,412,388 above those for the previous week, the total valuation being $7,122,000, making the aggregate since January 1 $151,961,100, as compared with $166,809,046 for the corresponding period in 1885, and $151,936,797 in 1884. The items include 182,541 barrels of flour, 1,168,829 bushels of wheat, 400,328 bushels of corn, 19,638 bales of cotton, 5,900,921 gallons of petroleum, 5,748,411 lb of cut meats, 5,869,846 lb of lard.

According to the Custom-House reports the imports of specie at New York last week were $47 355, and the exports amounted to $1,806,958, making a total since January 1 of $38,233,364, as compared with $14,748,726 for the same time in 1885 and $44,407,692 in 1884.

Borrowers from savings banks, owing to the action of the last Legislature in relation to securities pledged, are now much less restricted. As the law stood banks could not loan more than 100 on securities having a market value above par, whereas loans can now be made to the extent of 90 % of market value.

Metal Market.

Copper.—During the week our market has been stagnant and nominal, with buyers of Lake Superior spot at 9.90¢, and possibly 9.95¢ might be paid, futures at the same time being saleable at 10¢ for August, and 10.05¢ @ 10.10¢ for September to October, with no inclination to do much one way or the other. Meanwhile Chili Bars fluctuated in the London market as follows: June 24, 25 and 28, £39. 15/; and 26–29 and this morning, £39. 17/6, Best Selected not varying from £44. Messrs. James Lewis & Son, Liverpool, June 16, say in their circular: "American arrivals in England and France to date have been 7,909 tons, against 17,581 in 1885, a decrease of 9672 tons. It is stated that 9000 tons of American Ingots, 3000 tons of which have been refined from Anaconda Matte at Baltimore, are offered for sale in the English market for early delivery." We are cabled from London that the market is a little firmer.

Tin.—Since our last issue the London market continued for another day in its downward tendency, touching on Thursday £99, spot, and £99. 15/, futures. This reaction had evidently been manipulated, for the next day the market rebounded to £101. 10/ and continued in its upward flight until Monday, when £102. 10/, spot, and £103. 10/, futures, was realized, with further buyers, and no sellers. Another attempt is now being made in London to break the market, and they close to-day at £101. 10/, spot, and £102. 2/6, futures. Our own market naturally followed in the wake of the London market, and prices on this side were forced down to 22¢ in order to recover the following day to 22¼¢, and it has since continued to improve until 22.90¢ is paid for spot, 23¢ for July and August, and 23.05¢ for September and October. Fresh shipments from London successively realized 22¾¢ @ 22.90¢ and 23.05¢. Since then a slight reaction has again set in and spot tin has been obtainable at 22⅞¢; July delivery has been sold at 22 75¢, @ 22.85¢ whereas August-September delivery closes with buyers at 22.80¢, without leading to any business. We must be prepared henceforth to witness a repetition of similar rapid oscillations, but they do not prevent the tendency from remaining decidedly upward; however, those disappointed in having a share in the good things will doubtless try their utmost to get in, and this explains the violent fluctuations now characterizing the London market. London cabled this morning £101. 10/, Straits, spot, and £102. 2/6, three months. We are cabled this afternoon that the market is not so steady. *Tin Plates.*—There seems to be a comparative scarcity in Cokes and some grades of Charcoal; the market is steady, with a good consumptive demand at current rates, which may be called at the close, large lines, ordinary brands, ₱ box: Charcoal Bright, $4 85 @ $5.50; do. Ternes, $4.25 @ $4.75, and Coke, $4.40 @ $4.62½. Liverpool meanwhile is well sustained at 15/6 @ 17/6, Charcoal, and 13/3 @ 13/9, Coke.

Lead.—There sold since our last report 1000 tons Common Domestic in lots at 4.85¢ @ 4.90¢, at which the market closes quiet, but firm, with Refined worth 4.95¢. St. Louis quotes 4.65¢, and Chicago, 4.70¢. Foreign gave way from £13. 17/6 in London, Soft Spanish, to £13. 5/, the price here for the latter being $5 @ $5.05. July will, of course, as usual, be a dull month, but this will not detract from the promising position of the metal.

Spelter and Zinc.—Common Domestic Spelter has been featureless at 4.40¢ @ $4.60¢, and Silesian is nominally worth 4⅞¢ @ 5¢, the latter being quoted in London £13. 17/6, as heretofore. Bertha Refined we quote 8¢. *Sheet Zinc* is quiet and unaltered at $5.50 @ $5.70.

Antimony.—The market has been steady at 8¾¢, Cookson, and 8¼¢ @ 8½¢, Hallett. The latter remains £33 in London.

New York Metal Exchange.

The following sales are reported to have taken place on the floor of the Metal Exchange:

THURSDAY, June 24.

10 tons Tin, July	22.05¢
5 tons Tin, spot	22.15¢
10 tons Tin, July	22.15¢

FRIDAY, June 25.

5 tons Tin, July	22 40¢
5 tons Tin, July	22.45¢
10 tons Tin, July	22.65¢
5 tons Tin, August	22.75¢
5 tons Tin, July	22.70¢

MONDAY, June 28.

10 tons Tin, spot	22.90¢
5 tons Tin, August	23 ¢
5 tons Tin, October	23.05¢

TUESDAY, June 29.

10 tons Tin, July	22.85¢

Old Metals, Rags, &c.

The purchasing prices offered by dealers are as follows:

Heavy Copper	₱ lb.		@	$0.07
Light Copper	₱ lb.		@	.06
Copper Bottoms	₱ lb.		@	.05
Brass, Heavy	₱ lb.		@	.05
Brass, Light	₱ lb.		@	.04½
Composition, Heavy	₱ lb.		@	.07
Lead, Heavy	₱ lb.	$0.04¼	@	
Tea Lead	₱ lb.		@	.04
Zinc	₱ lb.	.03	@	.03¼
Wrought Iron	₱ ton,	15.00	@	16.00
Light Iron	₱ ton,		@	9.00
Stove Plate Iron	₱ ton,		@	9.00
Machinery Iron	₱ ton,		@	14.00
Grate Bars	₱ ton.	5.00	@	6.00
Canvas, Linen	₱ lb.	.03¼	@	.03½
Canvas, Cotton	₱ lb.	.03¼	@	.03¾
Canvas, No. 2	₱ lb.	.02½	@	.02¾
White No. 1	₱ lb.	.03¾	@	.03½
White No. 2	₱ lb.	.01¾	@	.01½
Seconds	₱ lb.	.00¾	@	.01
Soft Woolens	₱ lb.	.04¾	@	.05
Mixed Rags	₱ lb.	.01	@	.01¼
Gunny Bagging	₱ lb.	.01	@	.01¼
Jute Butts	₱ lb.	.01¼	@	.01½
Kentucky Bagging	₱ lb.	.02¼	@	.02½
Book Stock	₱ lb.	.01	@	.01¼
Newspapers	₱ lb.	.00⅞	@	.01
Waste Paper and Scrap	₱ lb.		@	.00½
Kentucky Bale Rope	₱ lb.	.03½	@	.04

Progress in Naval Architecture.

It is some times affirmed that while during the last quarter of a century great strides have been made in marine engineering there has been little or no progress in naval architecture. Engineers point with pride to the achievements of the compound engine, and more recently to those of the triple-expansion engine, and apparently look in vain for corresponding improvements in the allied industry of shipbuilding. Surely it should not be forgotten that if engines of increased and more economical power have been provided by engineers, shipbuilders have been equal to the task of providing steamers capable of utilizing this energy. There has, however, been decided progress in naval architecture, both generally and in detail. No longer is it considered necessary in a steamer of great speed to have a wedge-like midship section, for many of the fastest steamers afloat have great floor and comparatively slight transverse rise. To economically obtain speed experience has demonstrated that a gradual run aft of great length is more necessary than fine lines forward, while the at one time universal practice of having considerable dead-wood forward is now practically abandoned.

No doubt in "cargo carriers" some times they are now built so full forward and aft as to be even unfitted for the low speed of 8 knots, but recently there has been a tendency to give greater beam to steamers and somewhat easier lines, with manifest advantage both to their steering and propelling qualities. At one time long steamers in relation to their breadth were supposed to be the most suitable for high speeds, arising no doubt from what may now be considered to be a fallacy, that the power required to drive a steamer was in ratio to the square feet of immersed midship section. The City of Berlin is an example of this class, the length being nearly 11 times the breadth, while the quite as successful steamers Alaska and Arizona are exactly 10 times, the ill-fated Oregon 9.28 and the Aurania only 8 24 times the respective breadths, and yet they are all, considering their speeds, economically propelled vessels. In the construction of steamers there have also been great improvements. Twenty-five years ago there were few, if any, iron-decked vessels, now a leading feature in obtaining longitudinal strength. Steamers were then so short as not to make the question of strength such an important one, and all vessels were in the early days of iron shipbuilding excessively heavy in their scantlings at the ends, while deficient in provisions for strengthening the upper works and in continuity of longitudinal strength generally.

Exports.

The following list embraces the Exports of Hardware, Machinery, Iron, Metals, &c., from the port of New York, for the week ending June 29, 1886

	Quan.	Val.
Dutch West Indies.		
Mf. iron, pkgs	3	$13
Hdw., pkgs	2	77
Bremen.		
Ag.imp.,pkgs.	61	2,918
Saws, case	1	38
Hdw.,cs	13	1,065
Mf. iron, pkgs	17	319
Antwerp.		
Hdw., cs	40	391
Sew. ma., cs.	70	1,004
Bullets, case	1	12
Irons, cs	68	1,088
Mach'y, pkgs.	2	392
Ag. imp.,pkgs	2	45
Copenhagen.		
Clocks, cs	14	338
Ag.imp.,pkgs.	6	104
Mf. iron,pkgs.	10	300
Hdw., cs	18	371
Hamburg.		
Ag. imp.,pkgs	339	5,229
Mf.iron, pkgs.	6	154
Hdw.,pkgs.	143	3,396
Copper, cask	1	130
Sew. ma., cs.	1061	25,610
Pumps, pkgs.	8	253
Clocks, pkgs.	15	560
Tacks, cs	2	23
Mach'y, pkgs.	38	1,235
Armor, case.	1	175
Copper, bars	213	1,120
Revolvers, cs.	2	213
Arms, case	1	158
Br. g'ds., case	1	58
Rotterdam.		
Saws, cs	6	43
Pumps, pkgs	11	455
Hdw., cs	31	368
Clocks, cs	101	1,961
Water closets, bxs	6	45
Mach'y, pkgs.	28	1,200
Bristol.		
Ag.imp.,pkgs.	8	50
Liverpool.		
Ag. imp.,pkgs	105	2,063
Scales, case	1	31
Clocks, pkgs.	206	5,672
Metal lace, cse	1	851
Copper matte, bags	8366	62,100
Hdw., pkgs.	39	2,861
Mach'y, pkgs.	30	5,118
Arms, cs	6	918
Steel tires	3	30
Sew. ma., cs.	26	2,540
Mf. iron, pkgs	4	110
Pumps, pkgs.	2	196
Stampedware, pkgs.	9	360
Copper, casks	112	12,544
Glasgow.		
Sew. ma., cs.	168	1,650
W. wheel	1	298
Ag. imp.,pkgs	12	121
Oxide zinc, bbls.	100	788
Rifles, case	1	113
Guns, cs	5	104
Hdw., cs	6	133
Mach'y, pkgs.	15	2,900
London.		
Mach'y, pkgs.	42	3,499
Mf. iron, pkgs.	11	540
Copper, cask	1	130
Ag.imp.,pkgs.	394	9,330
Clocks, pkgs.	75	1,982
Sew. ma., cs.	111	1,738
Skewers, bbls	50	370
Hdw., cs	113	4,749
Pumps, pkgs.	26	869
S. rollers, cs.	20	150
Hull.		
Ag imp., pkgs	3	103
Cutlery, cs	12	220
Hdw., cs,	17	370
S. rollers, cs.	10	225
Clocks, pkgs.	4	181
San Domingo.		
Mach'y, pkgs.	50	210
Ag. imp.,pkgs	7	43
Nails, kegs	108	259
Hdw., pkgs.	27	641
Cartridges,cs.	32	1,014
Mf. iron, pkgs	50	475
Iron, pkgs	54	62
Sew. ma., cse.	1	17
Pumps, pkgs.	7	243
Cutlery, cs.	6	72
Firearms, cs.	16	3,622
Steel, pkgs	4	40
Agateware,cse	1	50
Clocks, cs	2	30
Venezuela.		
Nails, bxs	8	12
Mf. iron, pkgs	41	432
Pumps, pkgs.	2	46
Revolvers, cs.	3	1,620
Iron, pkgs	82	276
Tacks, cs	21	111
Clocks, cs	2	34
Sew. ma., cs.	8	210
Cutlery, cs	3	107
Iron safes	2	166
Hdw. pkgs	29	396
Cartridges, cs	2	91
Mach'y, pkgs.	15	674
Mf. nickel, cse	1	75
Mexico.		
Mach'y.,pkgs.	46	2,599
Hdw., cs	47	1,452
Ag.imp.,pkgs.	13	175
Valves, cs	2	700
Mf. iron,pkgs.	54	539
Cutlery, cs.	48	606
Nails, kegs	50	113
Mach'y, pkgs.	1	100
Surg. instruments, case	1	52
Cartridges,cs.	2	58
Boiler tubes	29	184
Tin plate, bxs.	8	76
Uruguay.		
Cutlery, case	1	128
Sew. ma., cs.	26	295
Ag. imp.,pkgs	1	5
Hdw., cs	47	851
Mf. iron, pkgs	75	1,560
Clocks, cs	3	138
Pumps, pkgs.	2	180
United States of Colombia.		
Hdw., pkgs	163	2,956
Sew. ma., cs.	116	3,560
Ag. imp.,pkgs	15	364
Pumps, pkgs.	12	165
Car wheels	152	1,928
Shot, bxs	14	74
Copper still, bxs	2	334
Iron, pkgs	24	41
Y.met.sheathing, cs	100	8,370
Sht. lead,rolls	8	400
Iron tank	1	356
Mf. iron, pkgs	652	4,967
Cutlery, cs.	51	1,206
Mach'y, pkgs.	905	18,862
Nails, kegs	323	756
Tinware, cs.	18	205
Steel, pkgs	64	1,175
Cartridges, cs	51	914
Revolvers, cs.	5	486
Clocks, cs	10	229
Rifles, cs	101	12,030
Iron safes	4	454
W. closet	1	33
Cop. boilers	2	74
Nails, cs	6	100
Central America.		
Hdw., cs	6	114
Arms, case	1	27
Mf. iron, pkgs	119	419
Brazil.		
Cutlery, cs	84	1,222
Guns, cs	3	230
Sew. ma., cs.	60	892
Mf. iron, pkgs	10	55
Car wheels	142	1,224
Hdw., pkgs.	164	2,249
Nails, kegs	106	345
Tacks, cs	14	90
Nails, cs	5	35
Cartridges, cs	9	220
Argentine Republic.		
Ag. imp.,pkgs	893	24,338
H'p iron, bdls	340	575
Tin boxes, cs.	8	63
Guns, cs	5	581
Mach'y, pkgs.	10	6,508
Scales, cs	25	630
Nails, cs	10	145
Cutlery, cs.	5	425
Sew. ma., cs.	271	5,064
Mf. iron, pkgs	198	2,233
Hdw., cs	308	4,586
Nails, pkgs.	27	340
Cartridges,cs.	5	113
Clocks, cs	115	1,664
Wash. mchs.	12	120
Pumps, pkgs	2	65
Spanish Possessions in Africa.		
Hdw., cs	24	237
Sew. ma., cs.	12	183
Mf. iron, pkgs	19	125
Clocks, cs	45	696
Iron safe	1	80
Lisbon.		
Knit.mchs., cs	20	424
Clocks, cs	92	1,011
Leghorn.		
Ag.imp., pkgs	7	210
Leith.		
Ag.imp.,pkgs	5	250
Hdw., cs	5	91
Tinware, cs	2	27
British West Indies.		
Mf. iron, pkgs	154	727
Iron safes	2	258
Nails, kegs	68	193
Tinware, cs.	12	107
Hdw., pkgs.	83	1,117
Scales, cs	20	142
Pumps, pkge	1	17
Sew. ma., cs.	11	188
Cartridges, cs	6	224
Clocks, cs	4	88
Mach'y, pkgs.	4	207
Cutlery, cs	2	17
Guns, cs	2	123
Newfoundland.		
Hdw., cs	43	355
Mf. iron, pkgs	2	38
Mach'y, pkgs.	6	90
Pumps, pkgs.	2	16
British Possessions in Africa.		
Hdw., cs	66	906
Ag.imp.,pkgs.	307	5,162
Canada.		
Wire, cask	1	200
Nova Scotia.		
Mf. iron, pkgs	29	151
Sew. ma., cs.	6	150
Hdw., cs	3	192
British Guiana.		
Ag. imp. pkgs	3	23
Hong Kong.		
Clocks, cs	20	333
Havre.		
Cop. ore, sks.	749	4,000
Mach'y, pkgs.	5	580
Jap.iron,bxs.	30	300
Pumps, pkgs.	5	400
Sew. ma., cs.	449	3,779
Copper, cask	1	130
Ag. imp.,pkgs	26	460
Hdw., cs	6	1,105
Bordeaux.		
Copper, casks	180	22,500
Sew. ma., cs.	352	5,547
French West Indies.		
Sew. ma., cs.	5	150
Mf. iron, pkgs	23	64
French Guiana.		
W.coolers,cse	1	5
Barcelona.		
Clocks, cs	21	489
Portuguese Possessions in Africa.		
Ag. imp.,pkgs	2	97
Genoa.		
Clocks, cs	11	329
Hdw., cs	2	18
Cuba.		
Cutlery, cs	161	2,984
Mf. iron, pkgs	848	3,062
Saws, case	1	132
Refrigerators	10	137
Tinware, cs.	17	574
Iron, pkgs	10	45
Ag.imp.,pkgs	30	1,708
Sew. ma., cs.	211	2,214
Cartridges, cs	5	156
Car wheels	50	550
Tacks, case	1	51
Iron safes	2	186
Sawmill	1	3,439
W. closets, pkgs.	7	265
Br. goods, cs.	4	160
Nails, kegs	1980	2,481
Hdw., pkgs	94	1,216
Clocks, cs	28	567
Scales, cs	7	69
Hose, cs	2	54
Iron, pkgs	53	333
Wire goods,cs	6	173
Mach'y, pkge.	1	40
Hayti.		
Nails, kegs	19	49
Hdw., cs	4	32
Sew. ma., cs.	14	160
Japan.		
Hdw., cs		79

Trade Report.

New York.

American Pig—During the past 14 days agents of Southern furnaces have sold for delivery during the next few months about 25,000 tons of Foundry Irons, in some cases at concessions from prices formerly asked. The majority of the Southern furnaces which have been sellers are now well booked, and will only take orders to accommodate regular customers, especially as there will be some falling off in the make in the next months, owing to blowing out of furnaces for remodeling. In standard brands little business is reported, though the deliveries on old contracts are heavier since the resumption of work in foundries closed down by labor troubles. It should be noted that a number of furnaces have changed to Bessemer, among them the Reading and the Warwick. The situation is such that it depends upon the developments of the next 30 days whether an upward tendency will be developed. We quote for standard brands, tidewater delivery, $18 @ $18.50 for No. 1 X Foundry, $17 @ $17.50 for No. 2 X Foundry, and $16 @ $16.50 for Gray Forge, with the market in buyers' favor. Outside brands are 50¢ below these quotations.

Scotch Pig.—The market continues dull, with small current sales. We quote nominally as follows for small lots: Coltness, $19.75 @ $20 to arrive; Gartsherrie, $19 @ $19.25 to arrive; Shotts and Langloan, $19.50 @ $20 to arrive; Carnbroe and Glengarnock, $18.50 @ $19 to arrive; Summerlee, $19.50 @ $19.75 to arrive; Dalmellington, $18.50 @ $18.75 to arrive; Eglinton, $17.50 @ $18 to arrive, and Clyde, $18 @ $18.50 to arrive.

Bessemer Pig.—We hear of the sale of a small lot of Foreign, special quality, and are reported the purchase by an importing firm of a lot of 6000 to 7000 tons in the Pittsburgh market. We quote Foreign nominally $18.75 @ $19, and Domestic $18 $18.50 at furnace.

Spiegeleisen.—We are reported the sale of a round lot at private terms. We quote nominally English $25.25, and German $25.

Bar Iron.—The market is quiet, but with less tendency to concessions. To-morrow a strike will be initiated at the Philadelphia mills for the adoption of the 2¢ card rate as the minimum in the basis for the scale. We continue to quote for delivery here in round lots: Common Iron, 1.65¢ @ 1.70¢; Medium, 1.70¢ @ 1.75¢, and Refined Iron, 1.75¢ @ 1.9¢. Store prices are 1.75¢ @ 1.80¢ for Common, 1.85¢ @ 1.90¢ for Medium, and 1.9¢ @ 2.2¢ for Refined.

Structural Iron and Steel.—There is considerable work in sight—more so, in fact, than for a long time—and in this city alone not less than 3000 to 4000 tons of material will be given out in the near future. There is less anxiety to sell, and buyers do not find it quite so easy a matter to shade quotations as in the past. We quote for Angles 2¢ @ 2.10¢, delivered, and Tees at 2.40¢ @ 2.45¢, for round lots. Steel Angles are quoted 2.35¢ @ 2.45¢, according to quality. Store quotations remain 2.25¢ @ 2.4¢ for Angles, and 2.6¢ @ 2.7¢ for Tees. American Beams and Channels are nominally 3¢ base from dock for all orders.

Plates.—During the next few days contracts will be awarded for the Steel Plates for two ferry-boats. We quote for round lots: Common or Tank, 2.12½¢ @ 2.20¢; Refined, 2¼¢ @ 2⅜¢; Shell, 2.4¢ @ 2½¢; Flange, 3.4¢ @ 3½¢; Extra Flange, 4¢ @ 4¼¢. For small lots of Steel Plates the quotations are as follows: Tank, 2.70¢ @ 2.75¢; Ship, 3¢; Shell, 3¼¢; Flange, 3½¢, and Fire-Box, 4¢ @ 4½¢, on dock.

Merchant Steel.—For Open-Hearth and Bessemer Steels concessions continue to be the order of the day. We quote nominally for the range from ordinary to good grades as follows: American Tool Steels, 7½¢ @ 9¢; Tool Steel of special grades and finer qualities, 12¢ @ 20¢; English Tool, 13¢ @ 15½¢; common grades, 7¢ @ 9¢; Crucible Machinery, 4.5¢ @ 6¢; Round and Flat Spring, 2.4¢ @ 2.6¢; Round-Edge Tire, 2.4¢ @ 2.6¢; Square-Edge Tire, 2.75¢ @ 2.9¢; Toe Calk, 2.7¢; Sleigh Shoe, 2.6¢ @ 2.8¢; Open-Hearth Machinery, 2.5¢ @ 2.8¢, and Bessemer Machinery, 2.25¢ @ 2.5¢, with freight allowance.

Wire Rods.—Sales have been on a little more liberal scale during the week, quotations remaining $38 @ $39 for Ordinary Rods. The Plain Wire trade is in a poor condition, very low prices having been made recently in the West. A German contemporary says of the Rod market: "The American works have increased their make in an enormous manner, having carried it from 50,000 tons in 1884 to 160,000 tons in 1885, and it is likely that the current year has brought about a further increase. It may be assumed, therefore, that the sale of Wire Rods to the United States will cease within measurable time. It is characteristic for the present condition of the Wire-Rod market that one of the largest buyers of Wire Rods exports the raw material, Wire Billets, from the Iron districts. One large English export concern has resold a large lot of Westphalian Wire Rods to a German Wire mill at 6 marks below the cost price, either to force down the price of Wire or because they had no market in America. The German Wire-Rod pool has in the meanwhile succeeded fairly well in maintaining prices, and it will be undoubtedly extended beyond the preliminary date of the agreement, the 1st of July. It has been proposed by some to increase the contribution to the general fund from which premiums are paid on output below allotment, partly in order to obtain a larger fund, which is always the best preserver of such pools."

Steel Rails.—No sales of any magnitude are reported by the Eastern mills. It is asserted that a contract for 14,000 tons to a road in the Northwest has been taken by one of the Chicago mills, and that the Western Steel Co. have secured an order for 15,000 tons at a price between $37.50 and $37.75 at St. Louis. We continue to quote $34 @ $35 at Eastern mill, according to size of order and time of delivery. We hear of a sale of 3000 tons of Foreign Steel-Rail Blooms to be rolled into Rails by an American works, Springfield being named. There are rumors of sales aggregating 20,000 tons of Foreign Rail Blooms at $24.50 at tidewater.

Old Rails.—There have been sales of round lots for Western delivery which pretty well fill up the Pittsburgh and Mahoning Valley. Foreign Double Heads and Bridges are being offered without takers. We quote the market $18.50 @ $19 for American T's.

Scrap.—The market is quiet. A lot of 600 tons of Foreign Scrap has gone into store. We quote $18 @ $18.50 from yard.

Rail Fastenings.—We quote nominally 2.40¢, delivered, for Spikes, and 1.80¢ @ 2¢ for Angle Fish Bars.

Messrs. Hugh W. Adams & Co., of 56 Pine street, this city, have been appointed agents of the Bangor Furnace Co., Bangor, Mich., Bradley, Graves & Co., Limited, lessees, manufacturers of Charcoal Pig Iron.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., Philadelphia, June 29, 1886.

The first half of the year, which opened with so much promise, has failed to meet the expectations that were so generally indulged in. This is due in a large measure to matters entirely unforeseen, such, for instance, as the socialistic outbreak in the West and the more or less unsettled feeling in regard to labor in other sections. Incalculable injury was done, but there was a feeling a few weeks ago that the storm was spent, and that the last half of the year would be more settled and more satisfactory in every respect. The new outbreak, however, admonishes us that the trouble is not settled yet, and, while there is no serious uneasiness in regard to the matter, it is of sufficient importance to attract attention and cause some hesitation in making forecasts as to the future. Apart from contingencies of this character, however, prospects are decidedly encouraging. There has been a great deal of work given out among large consumers of Iron, and a great deal more that probably will be given out within the next 60 days, and although prices are entirely too low the expectation is that there will be steady improvement as the season advances. Consumption has been very large this year so far, and is likely to continue so after the next two or three weeks, during which time there will be more or less suspension of work, but, once started, increasing activity is believed to be pretty well assured.

Pig Iron.—Without very wide fluctuations in prices the market during the past six months was one of greater interest than usual. The large and steadily increasing production was taken during the first four months of the year at gradually advancing prices, until at one time it looked almost like a repetition of the boom in 1879 and 1880. But the outbreak in the West, and the general demand for an advance in wages, seemed to destroy confidence, and for the past two months the best that can be said of the market is that it has held its own better than could have been expected. Good brands of Iron have not accumulated to any great extent, in some cases not at all, but, all the same, there is no denying the fact that most, if not all, the gain made in four months has been lost during the past two, so that practically prices are just about as they were early in January. There are exceptions, of course, but taking the market as a whole buyers can do quite as well as they could six months ago. As to the future it is difficult to say what the outcome will be, but the general feeling is hopeful and confident, and if nothing unforeseen occurs a steadily improving market is looked for, commencing probably in August, perhaps sooner. The supply of Pig Iron of one kind or another is large, the kind that consumers want is not large, and the heavy look that the market has is because there are so many trying to sell stuff that people do not want at any price. Good brands are believed to be at bottom figures, and on such improvement in values is only a question of time. Prices range about as follows: No. 1 Foundry at tide, $18.25 @ $19; Special brands, $19.50 @ $20; No. 2, do., $17 @ $17.50, and Gray Forge, $16 @ $16.50; Southern brands, ex-ship, $17 @ $18 for No. 1 Foundry; $16 @ $16.50 for No. 2, and $15 @ $15.50 for Gray Forge.

Steel Irons.—There has been a new trade springing up within the past year to meet the demand from makers of Open-Hearth Steel. The Castle Furnace, at Catasauqua, Pa., is finding ready sale for all it can make, as also the Soho, in Pittsburgh. These furnaces produce a grade of Iron specially adapted for the finer grades of Steel, and said to be lower in phosphorus and sulphur than any of the imported Irons. The foreign trade has been considerable, nevertheless, such brands as Ulverstone and Ridsdale having been sold very largely. In such grades as are used by the Bessemer companies the Cornwall furnaces have taken a large share of the business, while others, such as the Mohican, are gradually coming into prominence, and exercise no little influence in keeping prices within moderate limits. Quotations are difficult to get with exactness, but $18 at furnace is named for Cornwall and $21 for Castle, and about $19 @ $19.50 at tide for Foreign.

Manufactured Iron.—The demand during the six months has been larger than for a long time past, and on the whole prices have been well maintained. Fluctuations have been within narrow limits, and at irregular periods, according to the demand, sometimes 0.05¢ @ 0.10¢ dearer, and then, when business got dull, back again to the old figures. Compared with this date six months ago it is difficult to detect any change whatever, quotations being the same, although it is probable that holders are a little firmer. Cost of production has increased considerably, however, so that in that sense manufacturers are not as well off as they were at the time mentioned. Business has suffered a good deal from the strikes, and during the past two months the demand has been nearly all for small lots. Large orders were taken early in the season for shipbuilding, bridge-building, &c., as well as from the large machine shops, but these are now pretty well completed, and it is a little doubtful if they will be renewed on the same scale as before. The demand from other sources is better, however, so that on the whole prospects are considered fairly encouraging, both as regards the volume of business and prices likely to be realized, although much will depend on the outcome of events during the next 30 days. At a meeting of the rolling-mill owners held here to-day it was decided to reject the demands of the men for a change of schedule. The mills will close this week and not resume work unless the men come in at the old prices, which they declare they will not do. This, of course, means a strike in the Kensington district and the throwing out of employment of nearly 2000 men.

Steel Rails.—There has been remarkable uniformity in this department, and all that can be said is that there has been plenty of business at steady prices during the entire six months. Prices are just where they were in January, say $34.50 @ $35, with every mill in the country at work, and a large amount of business still in sight—more, in fact, than can be handled as promptly as desired. The outlook is in every respect satisfactory, and, while manufacturers do not think it wise to invite foreign competition by putting prices any higher, there is little doubt that $34 will be a bottom figure for 1886.

Old Material.—Fluctuations have been wider in this than in any other article on the list. During the first quarter Old Rails and No. 1 Scrap sold as high as $24, Philadelphia, but gradually declined to about $18.50, but appear now to be on the up-track again at $19 @ $19.50. The advance to the high figure named was entirely speculative, but on the present basis of values they are considered safe property to hold.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Avenue, Pittsburgh, Pa., June 29, 1886.

While general business cannot be termed active, there is a decidedly better and more cheerful feeling, which goes a good way in bringing about an improvement. The fact that the wage-scale as regards the iron-workers and nailers has been settled for a year to come has had a good deal to do with creating a much better feeling in business circles. The reports from the South and West, the latter in particular, are generally of an encouraging character, and our manufacturers, almost without exception, are expecting a good fall trade. The indications are that general business, not only here, but throughout the country, will be much better from July to January than it was from January to July. Natural gas and oil development is still being pushed forward with a good deal of vigor, the former in particular; pipes for natural gas are being put down in nearly all the principal streets, and within another year or two gas as fuel will be as common as the city water. Other points, including Wheeling and Cleveland, will be furnished with natural gas before long. Youngstown, Ohio, expects to have it in August next.

Pig Iron.—There has been no important change in the general position of the market since our last report. Demand as a rule continues light, consumers buying Iron only as they need it, and it is likely that this policy will be generally adhered to until after the work of stock-taking and repairs is completed. There is still considerable Southern Iron being offered here, and while we hear of but little of it being sold it has its effect upon the market. Consumers continue to look upon these Southern Irons with more or less suspicion, and all effort thus far to convince buyers that they are equal to home-made Irons has proved unavailing. Within the past few weeks prices have gone off fully 50¢ ℔ ton, and the decline may to a considerable extent be attributed to these Southern Irons. We quote as follows:

No. 1 Gray Forge	$16.00 @	$16.25,	4 "
No. 2 Gray Forge	15.50 @	15.75,	4 "
All-Ore Mill	17.00 @	17.50,	4 "
White and Mottled	14.50 @	15.25,	4 "
No. 1 Foundry	18.00 @	18.50,	4 "
No. 2 Foundry	17.00 @	17.50,	4 "
Charcoal Foundry	20.00 @	23.00,	4 "
Cold Blast Charcoal	24.00 @	27.00,	4 "
Bessemer Iron	18.50 @	19.00,	4 "

There has been considerable activity in Bessemer Iron the past week, sales aggregating some 10,000 to 12,000 tons being announced, and all for a basis of $18, cash. We are cognizant of a sale of 6500 tons at $18, cash. This was bought for Naylor & Co., of New York, on speculation, and will be held here for a better market.

Muck Bar.—There is some inquiry, and the market may be quoted steady at $27 @ $27.50, cash, according to quality.

Manufactured Iron.—Business continues to keep up very well for this month, as the mills are nearly all in operation, some of them working double turn; orders as a rule are small, but amount to considerable in the aggregate. The outlook is very generally regarded as being favorable for a good fall business. Stocks, both in the hands of jobbers and consumers, are known to be comparatively light, and, with good crops and labor complications about disposed of, there is reason to look for a good trade in all kinds of Finished Iron the coming fall, and manufacturers are hopeful that prices will steady up. We continue to quote first-quality Iron on a basis of 1.65¢ @ 1.70¢ for Merchant Bars; Old-Rail Iron, from $\frac{1}{10}$¢ to $\frac{2}{10}$¢ less; a good many buyers are willing to pay the difference for the former.

Nails.—The conference committee, after several protracted sessions, arrived at an understanding, and the Nail strike—the longest on record—was brought to a close. The wage-scale accepted by the nailers is the same that was offered them June 1, 1885, so that the manufacturers have carried their point, although, as a matter of course, they lost a good deal of their trade. Pittsburgh for over a year has been obliged to draw her supplies from competing points, and jobbers who were formerly supplied by Pittsburgh manufacturers have been obliged to look elsewhere. Some of this trade will be recovered, but a good deal of it has been lost. The strike was a godsend to Eastern Nail manufacturers, as they were thereby enabled to enter Western markets from which they were before shut out. The work of repairing the Nail factories has already been commenced, and it is probable some of them will be started up within a few weeks, as there is no stock and it will be necessary to work up an assortment. The outlook is regarded as being favorable for at least an average fall trade. The following named Pittsburgh firms have Nail factories, and it is probable that they will be started up as soon as they can be placed in condition: Chess, Cook & Co., Zug & Co., Shoenberger & Co., Jones & Laughlins and Moorhead Bros.

Wrought-Iron Pipe.—There is nothing of an important character to report; no abatement in the demand and not likely to be until the advent of winter. Mills are all as busy as they can be, and it is difficult to place an order of any magnitude for immediate delivery, as the mills are all sold ahead. Prices unchanged, with the exception of ⅜-inch Casing, which has been advanced to 45¢ ℔ foot, net. Black Butt-Welded Pipe in carlots, 45 % discount; Galvanized do., 35 %; Black Lap-Welded Pipe, 60 %; Galvanized do., 42½ %; less than a carload, discounts 2½ % less than rates above quoted. Boiler Tubes, 52½ % off; 2-inch Oil-Well Tubing, 14¢ ℔ foot, net; 8-inch Drive Pipe, $1.30.

Steel.—The Merchant Steel trade is a little quiet at present, as is usually the case in June; it is expected that there will be an improvement next month. Prices unchanged. Refined Cast Tool Steel, 8¢ @ 9¢; Crucible Machinery, 3¼¢ @ 4¢; Open-Hearth do., 2½¢ @ 2¾¢; Steel Boiler Plate, 4¢ @ 4½¢; Bessemer Blooms and Billets, $31 @ $33 ℔ ton; Steel Bloom Ends, nominal at $20.50 @ $21; Steel Rail Ends, $21 @ $21.50.

Old Rails.—We are reported a small sale of Old Iron Rails at $21 here, and we hear of a sale at $21.25, delivered at Youngstown. Large consumers here are pretty well supplied, and there is not much inquiry in consequence. Old Steel Rails quoted at $20 @ $20.50 for short and $22 @ $22.50 for long lengths. We are advised of sales of short lengths at $20.

Railway Track Supplies.—There is a fair business; no change in prices. Spikes, 2.40¢, 30 days, delivered; Splice Bars, 1.65¢ @ 1.75¢; Track Bolts, 2.75¢ with Square and 2.85¢ @ 3¢ with Hexagon Nuts.

Steel Rails.—There is a fair inquiry; no change in prices. Heavy sections, for fall delivery, $36 @ $36.50, cash, at mill. Very few, if any, of the mills in the country are in condition to take any orders for July and August.

Old Material—There is rather more doing, and prices are firmer, but unchanged. Sales of Old Axles at $23 @ $24, net ton: No. 1 Wrought Scrap, $18; Axle Turnings, $14 @ $15; Cast Borings, $11 @ $12, gross ton; No. 1 Cast Scrap, $14 @ $15, gross; Old Car Wheels nominal at $16, gross.

Window Glass.—There has been no change in the position of the Window-Glass trade, but there is every indication of an improved trade this fall. Prices unchanged. Discount on Single Strength, 75 %; on Double Strength, 75 and 10 %.

Coke.—Blast-furnace Coke remains unchanged at $1.50 ℔ ton, free on cars at ovens.

Chicago.

Office of *The Iron Age*, 36 and 38 Clark St., Cor. Lake St., Chicago, June 28, 1886.

The laboring classes of this city seem to have a mania for strikes. Scarcely a week has passed since May 1 that there has not been some fresh outbreak. Since the ending of the general strike none were of a character that affected business outside of the lines in which it occurred until last week, when the switchmen on the Lake Shore Railroad went out on their second strike in two months. So far as shipping goes, tradesmen can get along without using this line, but the effect is more far-reaching. The men engaged in it appear determined not to give in until the company grant their demand. It is said the switchmen's union is backing the strikers, and, if so, all other roads entering the city may become involved. Thus far the strikers have confined themselves to persuading outsiders from taking their places, disabling engines, derailing cars and blockading the track to prevent freight from being moved, and have had things pretty much their own way. The strikers of the Calumet Co., at Cummings, are in sympathy with them and join hands in the obstruction to traffic. Considerable freight was delayed on the tracks, both east and west. Business men deplore this renewed disturbance, which, if extended to lines west, will counteract the improvement of the past month and shake the confidence that had just begun to manifest itself. In manufacturing circles there is still a degree of uncertainty regarding the position of the Iron manufacturers *versus* puddlers, rollers and nailers which does not tend to improve prices and regulate trade.

Hardware.—The only noticeable change is a decrease in the number of orders and the gradual falling off in general demand. Jobbers, however, have been kept fairly busy in supplying odds and ends to fill up the country merchants' stock. There has been some little inquiry for fall goods, but no buying of importance. Manufacturers are at present quite firm in their demands for fall delivery on such articles and lines as can be controlled. The volume of trade during the month of June has been exceedingly satisfactory, and makes the average of the first six months of the year much greater than was anticipated during May. With the exception of the withdrawal of price lists by manufacturers on special lines there is not likely to be any change in prices until fall trade opens. The ambition of jobbers located west of Chicago to capture trade heretofore sold by Chicago houses is resulting disastrously to profits on some lines of goods sold in that territory. The action of jobbers in the past six months located at different points in the West does not seem to concert with the harmony displayed in the adoption of the resolutions so liberally signed about January 1, in which they at least ostensibly agreed to observe uniformity in price and unanimity on advance and decline. A secret attempt to control or obtain trade regardless of competitors is frequently ill-advised and always demoralizing when it reaches those whom it was intended to injure.

Barb Wire.—There is no change to report in the conditions of the Barb-Wire market. Trade cannot get much less than it is at present, and there is no reason why it should revive until after harvesting is over. On sales jobbers continue the quotation of 3¼¢ for Painted Wire and 4¼¢ for Galvanized. These figures are given only as nominal, because there are manufacturers who would be willing to accept orders at a shade under price, according to quantity, more with a view of realizing the cash than of obtaining profits. We are informed that another secret meeting was held by the pool members during the past week, at which nothing of any great importance transpired, so far as can be learned.

Nails.—The Nail market at the moment is in a very unsettled condition. Reports that a scale of prices had been agreed upon between manufacturers and nailers, under date of the 25th inst., had a tendency to weaken the market on the supposition that the mills would resume with stronger forces and therefore increased product. Counter-statements under date of the 26th, that the nailers were not satisfied with the scale and that business was likely to continue in the present shape, reversed the feeling among the trade and perhaps inclined jobbers to place orders. From such inquiries as they have made from manufacturers it would appear that prices are more firm than 10 days ago, and it is possible that no Iron Nails could be had at less than $2, delivered. In small lots from store jobbers are quoting $2.10 for Iron Nails and $2.20 for Steel Nails as their regular price. Those who have the stock shade these prices 5¢ in carload lots. Some of the jobbers of Hardware refuse to sell Nails where the order does not include other

goods. It is said the demand from country buyers holds on very well for the season, and, if anything, has increased for delivery 30 and 60 days hence. Neither manufacturers nor jobbers are of one opinion regarding future prices. Stocks are small in all sections of the country at the present time, so far as can be learned, but if the 17¢ scale is accepted it will likely increase the product, and to a degree retard buying. Should the manufacturing of Nails be continued under the same conditions as during the past year the supply can be pretty well gauged, and the chances are that Nails will command a better price. It is claimed that the only thing to controvert this point will be the determined effort of manufacturers of Steel Nails to drive Iron Nails from the market. It has now become general in the minds of the trade that this is at least one cause for the low figures at which Nails are selling. Manufacturers quote prices to jobbers for immediate delivery only.

American Pig Iron.—The market is, if anything, a trifle better than a week ago. With the hardening of prices buyers become more active, and each time they have approached sellers recently they have found less chance to gain concessions. In fact, sales of small lots have been made at 50¢ ℔ ton above the price that was asked at the beginning of the month. This is exceptional, however, and does not hold good on all brands of Charcoal, Coke or Softeners, but serves to express the feeling among makers of standard Irons. Off brands, for which there is less demand, can be had as cheap now as at any time in the last two months, but sellers will not shade the price and are asking from 25¢ to 50¢ more from the general run of buyers. In carlots sales have not been in proportion to the number of inquiries, and yet there has been a fair amount of Iron sold, considering that most of what is taken during this and next month is for finishing the year's product. Implement makers do a great deal of looking around about this season of the year preparatory to buying for their next year's stock, which gives sales agents plenty of figuring and watching. Negotiations are also in progress for additional blocks of Charcoal Bessemer, which will be required before the close of the year. Throughout there is evidence that more Iron is wanted and that buyers are accepting the present situation as favorable to the placing of their orders. Furnacemen, having gained through their efforts to obtain higher prices, are meeting with less opposition from the trade than was expected. All buyers are generous enough to concede the fact that there is no large profit in present prices, and are ready to accord the advance in the hope that it will stimulate trade and general business. Sales of Lake Superior Charcoal Irons have been made in the past week in carload lots on a basis of $20.50, and shaded in larger quantities at $20, four months. Options taken a week ago by Car-Wheel men are still out, and some contracts which are pending for large lots may be closed in the course of a few days. Coke Irons are also in good request, but in smaller quantities, quotations ranging from $19 to $19.50 in carload lots, four months. Ohio Standard Blackbands are taken with so much regularity that there is less reason to expect fluctuations in price than on either of the other Irons. The best brands are quoted from $19.50 to $20.50, carload lots, four months, and in such quantities it is not likely that these prices can be shaded. There is, however, a possibility that contracts for a six months' supply will be made at a fraction below these figures, as there is an inclination on the part of some manufacturers to give this Iron a trial in a new mixture, and as furnacemen have been seeking for this trade it is believed they will concede a point in order to have them take hold. This action, however, would not change their market price to any other class of consumers. Cinder Mixed Irons are quoted at $18 for the general run, while on several brands 50¢ additional is asked. It is remarked that Southern Irons are a shade firmer, and we hear of higher prices having been asked by sales agents, but learn of no sales that have been made at figures which would warrant our making more than a nominal quotation of $17.50 @ $18 for No. 1 Foundry; $17 for No. 2; $16.50 for No. 2½, and $1 less for No. 3. In the latter class of Iron, buyers do not show any anxiety to place orders, though it is understood that some few sales have been made of small lots recently.

Merchant Steel.—The market for Merchant Steel remains quiet on the general line, though a little more trade is noted in Tool Steel for future delivery. More inquiries are received by manufacturers, apparently for testing the strength of prices. Some improvement is looked for during the coming month, and possibly prices, which are now weak and irregular, will be shaded to those who are willing to contract for the year's supply. This at least is expected by a portion of the trade, and they are preparing to make the best figures in order to get the contracts. Sales agents report that combination prices are being cut in various parts of the country, which demoralizes merchants in placing orders for all classes of Steel. Former quotations are unchanged.

Steel Rails.—There has been a fair demand for small lots of Steel Rails for immediate delivery, but manufacturers here are unable to accept orders for anything except late fall delivery. It is also said that inquiries have been made, and in one or two instances contracts were placed, for Rails to be delivered next spring. No lots of importance have been in demand for late fall delivery, so far as we can learn. Mills continue the quotation of $38 for first quality and $34.50 for seconds

Bar Iron.—There has been only a fair trade for the Best Refined New Puddled Iron during the week. The signing of the scale by manufacturers has allayed the fear that there would be an advance in price on this grade of Iron. Quotations at mill are made at 1.75¢ rates and from store at 1.85¢ rates. The demand for common Iron is very slow and prices irregular. Manufacturers quote 1.55¢ rates base from mill in carload lots to general consumers, and jobbers quote 1.75¢ rates from store in small lots. We hear of several sales of Iron, carbuilders' specifications, which were made at figures said to be considerably less than the lowest quotation. Merchants report that mills are unwilling to accept contracts for delivery after July 1, and that their prices are stronger than they were two weeks ago. There seems, however, to be such a vast difference in the statements regarding mills and their position on price that in the present demoralized condition of the market one can hardly arrive at any conclusion other than that the market is weak and irregular.

Structural Iron.—A little more than the usual demand for small lots of Beams has been received during the past week. These come largely from country places, to be used in work that had been laid aside during the strike, and recently taken up with the view of completion. There has also been some further inquiry for Bridge Material, upon which most of the makers claim that they are pretty well supplied with orders. No changes are reported in the price of Beams or other Structural Material.

Black Sheets.—Jobbers who are handling only the best grade of Black Sheets report a fair trade in small lots, with some improvement in the demand from heavy buyers. Prices on this grade of Iron have been fairly firm, and an average of about 20¢ advance on our quotations has been obtained for this grade of Iron. On the common grade of Black Sheets in light numbers trade has been fairly good from store, which jobbers quote as follows: No. 24, 2.80¢; Nos. 25 and 26, 2.90¢ and No. 27, 3¢.

Galvanized Iron.—There has been less business done in Galvanized Iron during the past week than the week previous. Cornicemen report that they are having considerable work, all in small jobs, at very low prices. Jobbers quote from store: Juniata 60 and 10 % off, and Charcoal 60, 10 and 5 % off. A circular to the trade recently announces the sale of the rolling mills of the Volta Iron Co., at Apollo, Pa., to the Apollo Iron & Steel Co. They promise the trade an increased production of high standard Soft Steel Sheets, and guarantee a uniformly superior quality.

Old Wheels.—On small lots of Old Wheels $15 has been offered. Sellers are asking $15.50, cash, and refuse to sell for less.

Scrap Iron.—There is no increased demand for Scrap Iron and prices are weak. No. 1 Wrought is nominally quoted at $17.50, No. 1 Mill at $14, and No. 2 $9.

Pig Lead.—The week past has witnessed an improvement and fair demand. Sales of some 650 tons have been made at 4.65¢ @ 4.67½¢. The concentration of stocks in New York and their scarcity in the West have advanced prices to the latter figures.

Birmingham.

BIRMINGHAM, ALA., June 28, 1886.

Rains continue, and the hopes of the Alabama farmers and those who are dependent upon their custom sink lower and lower. Two bright days in the past week counted for very little against the drowning-out the crops have undergone. While the sun shone, though, business was very fair in this city; elsewhere in this territory it seems to have been tame enough.

Pig Iron —Iron of all kinds seems weak, Pig Iron more so than there has been any reason to expect. Recent sales are reported at quite as low figures as have been accepted any time this year. Imprudent cutting among Southern furnaces has undoubtedly helped to bring things to this pass, but apparently the demand does not quite hold up to what it was some three weeks ago. Certainly the promises of that time have not been realized. The extension of the Pig-Iron industry of the district continues to be one of its most cheerful features. Just now the reassurance in this respect is abundant. Within a week in the State something substantial has been done toward the erection of as many as four new furnaces. The Pioneer Mfg. Co. (Mr. Samuel Thomas and associates, all of Pennsylvania) have broken ground for their first furnace, of 100 tons capacity, some 3 miles from this city, and for 150 Coke ovens and 50 brick tenement houses. The DeBardeleben Coal and Iron Co. have resumed work at a new site, some 2 miles nearer town than the old one—which is to say some 10 miles out. Their project contemplates two furnaces to make about 100 tons each. Contracts have been closed for a second furnace at Sheffield. These with the plants actually under way in or near Birmingham make nine new furnaces that Alabama will have very soon. There is promise of others, too. The latest thing in this line is a pending trade of Eastern capitalists for a tract of Iron lands not far from here.

Finished Iron.—So far from getting the better prices they hoped for, the rolling mills here have had to meet fresh cuts in the last few days. In certain lines Northern competitors for Western trade are holding them down to uncomfortably close margins. The demand has fallen off a little, too, without apparent cause.

Miscellaneous.—It is a dull week now for the newspapers when there is not some new enterprise to announce in Birmingham. The last few days have brought assurance of several of these. The most considerable is another gin and machinery concern, and the next machine and repair shops, the capital to come from the East in the latter case. Of the enterprises already here one is busy now on two hoisting outfits for new mines, and another on the Cast-Iron work for an important new local street railroad. A third is making a small ice machine which works very successfully and promises in a measure to revolutionize the ice business.

Coal.—One of the hoisting outfits mentioned above is for the Pratt Coal and Iron Co. The leading domestic Coals are just coming into market again. Carload prices for summer delivery, f.o.b at this point, average about as follows: Montevalto, $3.25 ℔ ton; Helena and Cahaba, $2.50; Pratt, $1.75. Steam Coals, which in this market come almost exclusively from the Warrior field, bring about $1 25 at most of the mines, the more favored operators in the matter of transportation delivering here at that figure.

Chattanooga.

Office of *The Iron Age*, Carter and Ninth Sts., CHATTANOOGA, June 28, 1886.

There can be no question that many parts of the South are just at the present time undergoing something like a boom, especially in the Iron districts. In some localities all kinds of real estate have advanced to what would appear to outsiders extravagant figures. Owners of Ore and Coal properties that sell their holdings regret it when they see the same property resold at an advance of 25 % to 100 % in a few days. New manufactories, too, are talked off in all directions, and many of the parties are known to have plenty of means to carry out anything they may take in hand. To what extent this condition of affairs will continue is, of course, problematical, but it is quite certain that much permanent good will result to the Southern Iron districts, and, of course, will extend and ramify its influence into every section of the South. Business is extremely good for the season of the year, and there is a marked increase in the deposits in all the banks of the country. Discounts are getting cheaper, and good names do not have to go outside to get accommodations.

Pig Iron.—There is no change to note in prices, and shipments are about the same as usual The movements in the direction of the Eastern States are increasing, and that section of the country is now looked upon as an important field for our products. Scarcity of Coke is still an important drawback to the total capacity of the furnaces, although it would seem from the efforts that have been made by the Coke men that this would soon be remedied, but the craters of the 22 large Coke furnaces that are dependent upon this article for their life are unsatisfied in their demands and still call for more. There is a noticeable increase in the demand for Pig, and it would seem from the amount that is daily turned out that there would be some piling up of stocks, but such is not the case to any extent, for Irons are slow of sale, while the furnaces that are turning out standard goods have no trouble whatever in selling their entire output before it is made.

Miscellaneous.—The most notable event of the week is the resolutions passed by the Board of Directors of the Roane Iron Co. to at once convert their works in this city into a Steel plant for the manufacture of Bessemer Steel. Movements have already been made in that direction. The capacity of the works will be about 140 tons per day. It is the intention of the company to utilize one or more of the furnaces in this district to smelt the Cranberry Ore, but they will erect a furnace as soon as practicable which will be run exclusively for making their own metal. The works will be under the immediate control of Mr. J. S. Goldstein, a gentleman well known in the Steel districts of both Missouri and Pennsylvania. The starting of these works, the establishment of the largest Pipe works in the world among us, and the eleven new blast furnaces that are now in course of construction in the Southern Iron district, are important items in the development of the Iron interests of the South.

Cincinnati.

JUNE 28, 1886.

Pig Iron.—From dealers there is no improvement reported in the market; transactions are confined to small orders to supply immediate wants. No considerable negotiations are reported for larger supply to consumers. The market stands in *statu quo* as to demand and prices. From the fact that it is apparent that it there are more willing sellers than buyers, it is thought that present quotations will not be advanced in the near future. The outlook on the market is thought to be that present prices will obtain even as against the pressing efforts of sellers to get orders for Southern kinds. It is reported by producers of Hanging Rock Charcoal Irons that their product in prospect can all be placed at the quotations of to-day. The products of the various Coke furnaces throughout the West and South will doubtless be placed for consumption, as it is produced at the best prices obtainable. Quotations of reported sales in the past week, f.o.b. cars here, or less the freight to Cincinnati when orders are filled direct from furnaces, are as follows:

Charcoal Foundry		
Hanging Rock, Best No. 1, 4 mos.	$21.00 @	.....
Hanging Rock, Good, No. 1, 4 mos.	20.00 @	20.50
Hanging Rock, Good, No. 2, 4 mos.	18.50 @	20.00
Southern No. 1, 4 mos.	18.00 @	19.00
Southern No. 2, 4 mos.	17.50 @	18.00
Coke Foundry.		
Ohio and West Pennsylvania, No. 1, 4 mos.	18.00 @	20.00
Ohio and West Pennsylvania, No. 2, 4 mos.	17.00 @	18.00
Southern—Virginia, Tennessee, Alabama and Georgia, No. 1, 4 mos.	17.00 @	18.00
Southern—Virginia, Tennessee, Alabama and Georgia, No. 2, 4 mos.	16.00 @	17.00
Close Foundry and Mill grades	14.50 @	15.50
Silver-Gray Softeners.		
Ohio Stonecoal, No. 1, 4 mos.	17.50 @	18.50
Ohio Stonecoal, No. 2, 4 mos.	16.50 @	17.50
Ohio Stonecoal, No. 3, 4 mos.	15.00 @	17.00
Car-Wheel.		
Southern Warm-Blast Char'l, cash	17.50 @	18.00
Southern Standard Warm-Blast Charcoal, 4 mos.	23.00 @	25.00
Hanging Rock, Warm-Blast Charcoal, 4 mos.	19.00 @	20.00
Hanging Rock, Cold-Blast Charcoal, 4 mos.	23.00 @	25.00
Southern Cold-Blast Charcoal, 4 mos.	24.50 @	.....
Maryland and Virginia	27.00 @	29.00
Forge.		
Southern Coke, Neutral, 4 mos.	15.00 @	15.50
Southern Coke, Cold Short, 4 mos.	14.00 @	15.50
Southern Coke, low grades	13.50 @	14.00
Other makes, various grades	15.00 @	17.00
Scrap.		
Rails	20.00 @	20.50
Wheels	16.50 @	17.00
Wrought, for range of grades, ℔ 100 lb	.50 @	.85
Cast, for range of grades, ℔ 100 lb.	.30 @	.65

Customary discount, 40¢ @ 50¢ ℔ ton for cash from time price.

Louisville.

W. B. BELKNAP & Co., Louisville, write as follows, under date of June 28: Business continues moderate in volume. There is no anticipation of much advance in Manufactured Iron, but the shutting down of one mill on the Ohio River, which has taken the premium for the last year on low prices, may give additional strength to the rest. The establishment of mills at various points throughout the South and West has naturally caused restriction of the territory tributary to the older ones, and there is a good deal of complaint on this score from the latter. We are located about, as it were, on the dead point between North and South, and the two products meet here on common ground; the future alone can decide the preeminence. There promises to be a good demand for Apple Parers, and, as the fly season is now on, Horse Nails, Horseshoes, &c., are in better demand. The increased use of Wire Screens and Wire Cloth in this part of the country is a noticeable feature this season.

Bar Iron—Is unchanged in price, but if any tendency is to be noticed it is toward a slight improvement in price.

Hoops and Bands—Are low and seem likely to continue so.

Sheet.—There is a good deal of inquiry for Sheet, but still no advance in price. Several new mills are putting their product on the market this season, which, added to the increased output of the old ones, seems more than ample for demands. Roofing and Corrugated factories take up large quantities of Sheet, and the use of Iron for these purposes is growing in favor every day.

Nails.—The interesting feature of the week has been the settlement of the nailers' strike, now more than a year old. Nails, however, were selling so low that some of the largest manufacturers declare that they can stand no more shrinkage; that the nailers coming in will not affect the price.

Barb Wire—Is moving but slowly. Manufacturers declare that they have made all the concessions possible; that any change shortly must be for the better.

Steel.—Some of the large contracts for Steel Agricultural Implement factories have been placed here lately, amounting to several thousand tons. Prices paid were an advance on last year, which means necessarily an advance in the cost of finished goods. Advices from large metal centers would indicate that Steel stock, both raw and finished, is almost sure to be maintained, if not materially advanced before the end of the year.

GEORGE H. HULL & Co., of Louisville, report to us as follows, under date of June 29: Inquiries for Iron during the last week have been more numerous than during the previous week. Although actual sales have not been quite so large, yet larger buyers are showing some disposition to take hold at present prices. Prices remain ostensibly the same as in our last report. We quote for cash in round lots as below:

Pig Iron.		
Southern Coke, No. 1 Foundry	$16.50 @	$17.50
" No. 2 "	15.50 @	16.50
" No. 2½ "	15.00 @	16.00
Hanging Rock Coke, No. 1 Foundry	16.50 @	17.00
Hanging Rock Charcoal, No. 1 Foundry	18.00 @	19.00
Southern Charcoal, No. 1 Foundry	17.50 @	18.50
Silver Gray, different grades	14.00 @	15.50
Southern Coke, No. 1 Mill, Neutral	14.50 @	15.00
" " No. 2 " "	13 50 @	14.00
" " No. 1 " Cold Short	14.00 @	14.50
" Charcoal, No. 1 Mill	17.00 @	17.50
White and Mottled, different grades	12.00 @	13.00
Southern Car-Wheel, standard brands	24.00 @	25.00
Southern Car-Wheel, other brands	20.00 @	21.00
Hanging Rock, Cold-Blast	24.00 @	25.00
" " Warm-Blast	20.00 @	21.00

Old Material.—The Old Material market is without quotable change either in demand or price. There have been some sales of Old Wheels perfected during the last week at what would be considered full prices. There are comparatively few Wheels offered in this locality. We quote for cash as below:

Rails, ℔ ton	$20.00 @	$20 50
Wheels, ℔ ton	14.50 @	15.00
No. 1 Wrought, ℔ 100	.85 @	.95
No. 1 Country Wrought, ℔ 100	.70 @	.80
No. 2 Country Wrought, ℔ 100	.50 @	.60
No. 1 Cast, ℔ 100	.45 @	.55
Boilers, cut, ℔ 100	.60 @	.65
Boilers, uncut, ℔ 100	.40 @	.50
Flues, Tanks and Sheets, ℔ 100	.85 @	.95
Axles, ℔ 100 lb	.90 @	1.00

Detroit.

CHARLES HIMROD & Co., dealers in Pig Iron, Detroit, Mich., report, under date of June 28, as follows: Business has been more than brisk during the past week, several large contracts for Pig Iron having been let, and not the least in figures—that is, respecting quantity—was Lake Superior Charcoal Iron, one large malleable concern in Ohio having purchased from this district about 2000 tons. We learn that several others are in the market, and it really looks very favorable for an excellent business, at this time of the year, when trade ordinarily is quite dull. After the large trade that comes immediately upon the opening of navigation there is comparatively little to follow until the Agricultural Implement men place their orders at the first of the fall. This extra business in so large a volume as it is makes the Pig-Iron men feel quite jubilant over the prospects for the future, as well as over the actual results of the present. It is an obvious fact, if one glances over the Pig-Iron statistics as published, that there is more Iron being produced to-day than at any previous time, but still it is none the less true that there is an equally large consumption, and there can be little doubt that if the present activity and large demand continue prices will stiffen very materially before the end of the year. Old Material follows in line, with prices advanced a little, and apparently is a scarce article in the market. Particularly may this be said of Old Wheels, and we think the market fairly quotable to-day as follows:

Lake Superior Charcoal, all numbers	$22.00 @	$22.50
Lake Superior Coke, All Ore	20.25 @	21.00
Lake Superior Coke, Cinder Mixed	19.00 @	20.00
Standard Ohio Blackband	20.25 @	21.00
Southern No. 2	17.00 @	17.50
Southern Silvery, Open	17.00 @	17.50
Southern Silvery, Close	16.50 @	17.00
Jackson County, Ohio Silvery	18.50 @	19.00
American Old Iron Rails	20.00 @	22.00
Old Wheels	17.00 @	17.50

Baltimore.

W. N. WYETH, Iron and Steel merchant, 46 and 48 South Charles street, reports us the following, under date of June 28: Since our last report trade has ruled about the same as then stated—that is, quiet and depressed—and the little business doing is transacted at about cost. No improvement is looked for during the approaching heated term, but it is confidently expected a change for the better must manifest itself early in the fall on the basis that there is an end to every rope. We quote the list nominally unchanged at annexed figures:

Ref. Bar Iron, 1 to 6 x ⅜ to 1	℔ lb	1.85 @	2.10¢
" " 1 to 4½ x 1¼ to 1	℔ lb	1.85 @	2.10¢
" " ¾ to 2, Round and Square	℔ lb	1.85 @	2.10 ¢
Hoop Iron, 1¼ wide and upward	℔ lb	2½ @	2¾ ¢
Band Iron, 1½ to 6 in. wide	"	2.30 @	2½ ¢
Horse Shoe Iron	"	@	3.25 ¢
Norway Nail Rods	"	5 @	5½ ¢
Black Diamond Cast Steel	"	9 @	10 ¢
Machinery Steel	"	3½ @	4¼ ¢
Spring Steel	"	3½ @	4 ¢
Common Horse Nails	"	8 @	9 ¢
Railroad Spikes, 5½ x 9-16	"	2.80 @	2½ ¢
Perkins's Horse Shoes, ℔ keg of 100 lb			$3.85
" Mule Shoes			4.85
Boiler Tubes			52½ % off list

St. Louis.

ROGERS, BROWN & Co., St. Louis, W. H. SHIELDS, manager, report, under date of June 28: There is considerably more inquiry, and prices are correspondingly a little firmer. A better feeling prevails all round. There is good inquiry both for Old Rails and Old Wheels. We quote:

Charcoal Foundry.		
Missouri	$17.00 @	$18.50
Southern	17.50 @	18.50
Coal and Coke Foundry.		
Southern, No. 1	17.50 @	18.50
Southern, No. 2	16.50 @	17.50
Ohio Softeners	17.00 @	20.00
Mill Iron.		
Missouri	16.00 @	16.50
Southern	15.00 @	16.00
Car-Wheel and Malleable Irons.		
Southern	20.00 @	25.00
Lake Superior	21.00 @	23.00
Scrap, &c.		
Old Wheels	@	16.00
Connellsville Coke (Frick's)	@	5.65

Coal Market.

The week has been as dull as any this season, except as some little stir has been made here and there by the report of a probable advance in prices in July. This report has been made the most of in some instances, and sales have been made on the strength of it, but, as an old observer remarks, "people don't scare as much now as they used to." The standard companies as a rule report everything quiet, aside from deliveries on old account, and no special change is looked for right away. Prices are very much cut up among dealers generally, and can only be quoted at a wide range on account of different views and necessities. The average for Stove may be put down at $3.15 @ $3.40, f.o.b. Exceptions as low as $3 are heard of for inferior grades. Lehigh Broken and Egg are sold about $3 @ $3 25; Stove, $3.20 @ $3.40; Nut, $3 @ $3.15; Pea Coal, $2. Eastern men are inclined to advance rates of freight.

Bituminous Coal is quiet at about $3.25. The total amount of Anthracite Coal sent to market for the week, as reported by the several carrying companies, was 642,177 tons, compared with 627,356 tons in the corresponding week last year, an increase of 14,821 tons. The total amount of Anthracite mined thus far in the year 1886 is 13,776,727 tons, compared with 12,090,204 tons for the same period last year, an increase of 1,686,523 tons.

The official figures to the 1st inst. show that the quota for the first three months has been exceeded by nearly 500 000 tons, so that now there is a considerable surplus, which must be further increased should the market be unable to take the full quantity of Coal to be mined in July—2,500,000 tons. The Reading Co. began the shipment of Anthracite to Baltimore and Washington on Monday last at $1.75 ℔ ton freight.

Trade Report.

General Hardware.

The market presents few new features, and is not characterized by uniformity in tone, a few goods indicating a tendency toward lower prices and others being held at somewhat higher figures. The general tendency is, however, regarded as being toward firmness in price, and some advances are announced. The special features of the market are noted below.

BARB WIRE.

The New York Barb Wire trade is quiet, with a tendency in buyers' favor, the demand being moderate, as is usually the case in this season. The decline in Barb Wire during the past few months is due to the disappointingly small spring trade, which has in turn affected Plain Wire. The latter has been sold at very low figures in the West lately, a fact which may be held to account partly for the existing condition of affairs.

NAILS.

The New York Nail mark et is still irregular, some sellers declining to meet the lowest quotations made. It is pointed out in behalf of the Nail trade that the coming summer months will see the usual stoppages for repairs, &c., prolonged voluntarily by a number of the works. The starting of the Western mills, to which we allude editorially this week, is not expected to have any direct effect upon the Eastern market, the Western mills having for some time past fully covered the requirements of the Western trade, so that that territory invaded by the Eastern mills during the strike has been virtually abandoned by them some time since. We quote $2 to $2.05 for small lots of Iron Nails from store, with concessions for carload lots from dock.

MISCELLANEOUS PRICES.

Carriage Bolts are still held at about the figures that have prevailed for some time, but some of the manufacturers who have been refusing to meet extreme quotations are making concessions, and there is a nearer approach to uniformity in prices than there has been of late.

The low prices that have for some time been prevailing on Chisels and Drawing Knives have led the manufacturers to confer with reference to measures for an advance in the prices of this line of goods. A meeting was accordingly held in this city last Thursday, at which the leading manufacturers were represented. After thorough discussion an advance was detemined upon, and an extreme price named beyond which the goods are not to be sold.

The manufacturers of Augers and Bits held a meeting in this city last Thursday, at which action was taken making a further advance of about 5 per cent. in the price of this line of goods. The former prices were referred to as very generally sustained. The increased cost of the goods and the narrow margin at the late extreme rates are referred to as the reasons for this further advance.

The File market is characterized by some irregularities, and prices are slightly lower.

There is no material change in the Tack market since our last report, prices remaining about as at that time, with a tendency toward lower figures on some lines. There is, it will be borne in mind, some irregularity in the prices named by different manufacturers on the different kinds of Tacks. The tenor of our reports would indicate that the sales at the present time are limited.

Yerkes & Plumb, Philadelphia, advise us that they have mailed the following retail trade discount sheet to Hardware jobbers, requesting them to be governed by it in making their sales of this line of goods. As showing the goods manufactured by this house and the prices at which they are thus quoted it will be of interest to our readers:

	Dis. per cent.
Hammers, "Artisan's Choice" A. E. & A. E. B. F. Nail	40&5
Hammers, A. E. & A. E. B. F. Nail	40&5
Hammers, all A. E. Farriers'	40&5
Hammers, all Plain Eye Farriers'	40&5
Hammers, all Plain Eye Nail	40&5
Hammers, A. E. Riveting	40&5
Hammers, Plain Eye Riveting	40&5
Hammers, Tinners' Riveting and Paneing	40&5
Hammers, Engineers'	40&5
Hammers, Blacksmiths' Hand	40&5
Hammers' Coopers'	40&5
Hammers, Machinists'	40&5
Hammers, Carriage Ironers'	40&5
Hammers, Machinists' Octagon Pattern	50&5
Hammers, Chipping and Prospecting	40&5
Hammers, Brad and Carpet	40&5
Hammers, Shoe	40&5
Hammers, Vulcan Tool Co.'s A. E. Nail	40&5
Hammers, Vulcan Tool Co.'s Plain Eye Nail	40&5
Hammers, Quaker City Mfg. Co.'s A. E. and A. E. B. F. Nail	50
Hammers, A. E. Brick	40&5
Hammers, H. S Turning	40&5
Hatchets, Shingling and Claw	40&5
Hatchets, Half and Lathing	40&5
Hatchets, Broad	40&5
Hatchets, Barrel and Warehouse	40&5
Hatchets, S. C. S. Shingling and Half	33⅓&5
Hatchets, S. C. S. A. E. B. P., Shingling and Half	40
Hatchets, S. C. S. A. E. B. P., Lathing	40
Hatchets, Lathing, Philadelphia Pattern	40
Hatchets, Lathing, Chicago Pattern	40
Hatchets, Lathing, Boston Pattern	40
Hatchets, Ice	40
Hooks, Bush, Axe-Handle and Two Rings	40
Cleavers and Choppers	40
Axes, Boys' and Hunters'	40&5
Axes, Broad, Canada Pattern	40&5
Axes, Broad, Ohio Pattern	40&5
Axes, Broad, Penn. or Pittsburgh Pattern	40&5
Axes, Broad, Western Pattern	40&5
Axes, Broad, N. O., Canada and Ship	40&5
Adzes, Carpenters'	40&5
Adzes, Railroad	40&5
Adzes, Ship Carpenters'	40&5
Hammers, Drilling or Striking	60&5
Hammers, Masons' and Sorting	60&5
Hammers, Bush and Napping	60&5
Hammers, Boiler-makers'	60&5
Hammers, Spalling or Stone	60&5
Hammers, B. S. Hand	60&5
Hammers, Macadamizing	60&5
Sledges, Blacksmiths' and Coal	60&5
Sledges, H. S. Turning and Stone	60&5
Axes, Stone	60&5
Mauls, Railroad and Ship	60&5
Mauls, Wood-Choppers'	60&5
Mauls, Wood-Choppers' Straight Cut	60&5
Wedges, Oregon Pattern	60&5
Wedges, Truckee Pattern	60&5
Wedges, Coal	60&5
Wedges, Stone	60&5
Hammers, Vul. Tool Co.'s Striking	60
Sledges, Vul. Tool Co.'s Blacksmith and Stone	60
Wedges, Vul. Tool Co.'s Truckee Pattern	60&5
Wedges, Quaker City Mfg. Co.'s	60&5
Picks, Boiler, Mill and Stone	50&5
Chisels, R. R. Track, Cold and Hot	60&5
Chisels, Hand Chipping and Cape	60&5
Pincers, Nippers and Buttresses	50&10
Tongs, Blacksmiths'	50&10
Swedges, Fullers, Flatters, Hardies, Set Hammers and Creasers	60&5
Punches, Heading Tools and Pritchels	50&10
Bar, Railroad Claw	50&10

The Nimick & Brittan Mfg. Co., Pittsburgh, Pa., issue a circular announcing the recent changes in Lock list, and giving the following as the new list prices of the Locks affected: No. 0221, $2.40; No. 0401, $2.65; No. 01051, $2.40.

The Custer Beam Works, Philadelphia, Pa., have been recently improving the quality of their Keystone Scale Beams, which they are putting prominently upon the market this season. Their discount on the Keystone Improved is 60 and 5 to 60 and 10 per cent.

A meeting of the manufacturers of Cast-Iron Shelf Hardware was held last week in this city, when the following houses were represented:

PECK, STOW & WILCOX CO.
SARGENT & CO.
RUSSELL & ERWIN MFG. CO.
READING HARDWARE CO.
P. & F. CORBIN.

After a discussion of the condition of the market it was decided to make an advance of about 10 per cent. in this line of goods, but the precise discounts are not yet announced, the discount sheets being still in preparation. We are advised that the Perin & Gaff Mfg. Co. have since united in this action.

The Payson Mfg. Co., Chicago, Ill., have recently added two additional large sizes to their line of Transom Lifters, making their assortment of these goods to be represented by the following list, which is subject to a discount of 40 per cent.:

	Each.
No. 250, 3 ft. long, ¼-inch rod, Bronzed Iron	$0.60
No. 251, 4 ft. long, ¼-inch rod, Bronzed Iron	0.70
No. 261, 4 feet long, 5-16-inch rod	1.10
No. 262, 5 feet long, 5-16-inch rod	1.25
No. 273, 6 feet long, ⅜-inch rod	1.70
No. 275, 8 feet long, ⅜-inch rod	2.10

The following is the price list of Payson's Fish Stringers, a description of which is given among our Hardware Novelties on page 35, the list being subject to a discount of 45 per cent.:

No. 225, Iron Head and Steel Wire, per doz	$6.00
No. 226, Brass Head and Steel Wire	12.00
No. 227, Brass Head and Brass Wire, per doz.	24.00

ITEMS.

The Field Force Pump Co., Lockport, N. Y., in their revised illustrated catalogue and price list for 1886–87, illustrate their line of Lift and Force Pumps, Field's Improved Force Pumps, Economy Garden Engine, and a line of Cistern Pumps and other Iron and Brass goods. The introductory circular refers to the fact that they have added several new styles and sizes of Pumps, and have endeavored to make such changes as will serve the convenience of the trade. They also allude to their business as having steadily increased during the past three years, and to additions to their factory, giving increased facilities which enable them to fill orders promptly. They advise us that their smaller Pumps are extensively used to apply poisonous liquids to trees, plants and vines for the destruction of the apple aphis, coddling worm, &c., and to destroy the cotton worm also, and the scale bug on orange trees. As leading articles they refer to the Farmers' Force Pump, which is alluded to as especially adapted for spraying poisonous liquids on fruit trees, watering gardens and lawns, washing carriages, &c., and to the Household and Well Force Pumps.

The Empire Knife Co., West Winsted, Conn., announce to the trade that they have appointed McCoy & Sanders, 26 Warren street, New York, sole agents for the sale of the Empire Pocket Knives in the West and South, to whom orders may be directed with the assurance that they will receive prompt attention. They also call attention to their new solid Steel Blade Shear, with gold plated bow, guaranteed to hold its color and not to tarnish. It is claimed that it will wear as well as nickel plate, and makes an exceptionally attractive Shear.

E. Broad & Sons, St. Stephen, N. B., Canada, issue a very attractive catalogue, with illustrations, of some of their leading goods. It represents a line of Axes, Edge Tools, Picks, Hammers, &c. It is announced that they can supply Axes, Edge Tools, &c., of other patterns not represented in the catalogue, as it is their desire to furnish goods suited to every market. Alluding to the fact that they have found a market for their goods during the past 42 years in the Maritime Provinces of Canada, with increased facilities and improved machinery, they are prepared to extend their business to other parts of Canada and foreign countries.

Chas. W. Packer, Philadelphia, manufacturer of Ice Cream Freezers, refers to his new patent, March 10, 1885, as adding an important feature to the Freezers. The object of this patent is to secure a thorough scraping of the Can during freezing, and this is accomplished by a vibratory motion imparted to the scraping bar by which it automatically conforms itself to the inner surface of the can. The beater of the Standard Freezer is constructed with deflectors and lifters of a peculiar form, which are referred to as securing the maximum amount of agitation without multiplying external motions or gearing.

The much-talked-of-game of ball between the nines of Sargent & Co. and Smith, Lyon & Field was witnessed last Saturday by a large delegation of Hardwaremen. The game was closely contested, and finally won by the Smith, Lyon & Field Club, the score being as follows:

Innings.	1	2	3	4	5	6	7	8	9	
Sargent & Co.	4	0	0	0	0	3	0	0	0	—7
Smith, Lyon & Field	0	0	0	0	3	3	2	1		—9

The trade will observe the announcement on page 36 in which Joseph Allen, Palmyra, N. Y., calls attention to his Combined Anvil and Vise, an illustration of which is there given. His circular relating to it refers to it as a convenint tool for farmers and mechanics, embracing as it does in one article such a variety of iron-working tools. The moderate price at which it is offered is also alluded to.

Henry C. Duggan, who is known to the trade as the president of the Duggan-Parker Hardware Mfg. Co., St. Louis, Mo., has resigned that position, and he advises us that his address in future will be care of James L. Haven & Co., Cincinnati, Ohio.

Bartlett & Dow, Lowell, Mass., in addition to their Hardware business, are manufacturing a few specialties in Dairy Goods, among which Milking Tubes and the Common Sense Milk Pail are described in circulars which they issue.

Our readers will observe the announcement made by the Covert Mfg. Co., Troy, N. Y., page 18, in regard to the infringement of patents on their goods, with a special reference to the Covert patent for Rope Clamps, September 17, 1878.

We are in receipt of circulars issued by King's Great Western Powder Co., 200 Main street, Cincinnati, Ohio, relating to the Powder of their manufacture, with illustrations and descriptions of the different kinds and sizes, some of which are represented in their advertisement on page 38. They call particular attention to King's Quick Shot, a special brand of sporting Powder, which they have recently put on the market, and which is offered as the result of close and scientific attention to the production of an article of the requisite qualities. Attention has been given to the finish, size of grain and the details of manufacture, and the Powder is referred to as clean, strong, quick and cheap. The company issue a handy book for trap shooters and sportsmen, in which, besides the description of their Powders and testimonials from sportsmen, a variety of useful information is given, including a brief digest of game laws in different States, trap-shooting rules adopted by the National Gun Association, &c.

Dame, Stoddard & Kendall, Boston, Mass., issue a price list of Robert Murphy's Corkscrews, Oyster Knives, Shoe Knives and fine Steel Implements, for which they are agents. This illustrated list, representing well-known goods, will be appreciated by the trade, especially as relating to a line that, although sold for 25 years, has not before been represented in a complete price list. The leading goods to which it relates are Murphy's Hand-forged Skiving and Rubber Knives, Oyster Knives of numerous patterns, Corkscrews represented in full size, Steel Fish Spears and Gaff Hooks, which are shown in half size, Sardine Shears, Cheese and Flour Tryers, with many other articles of miscellaneous character. Prominent mention is made of the fact that the trade may rely upon the thoroughly good qualities of all articles bearing the stamp R. Murphy, Boston, very special care being taken to select steel adapted to the article to be made, and so hardened and tempered as to fit it for the particular work it is expected to do.

Our readers will observe the advertisement among the Special Notices on page 24 in which "W. H. S.," makes known his desire for a position with a Hardware or Iron house, and refers to his experience as bookkeeper, traveling salesman and agent for manufacturers.

The Chicopee Falls Screw Co., Chicopee Falls, Mass., have appointed J. C. McCarty & Co., 97 Chambers street, New York, their sole agents for the sale of their Screws, and have authorized them to quote their lowest prices and best terms. Orders and inquiries, it is stated, addressed to them will receive attention upon as favorable terms as if sent direct to the factory. The company purpose keeping in their store a stock sufficient to meet the ordinary requirements of the trade for immediate delivery.

WHAT THE TRADE SAY.

From Virginia we have the following communication relating to the putting up of shelf goods and other topics:

The discussions in your paper regarding better packages for shelf goods I most sincerely trust may bring forth the desired results, for I feel assured that the retailers will favor the goods of the makers who will act on this idea. I for one will take no other. If we will only pull together we can make the manufacturer give us what we are justly entitled to—better packages.

"Scratch All" is a brick; but why does he continue to place his orders with the man who charged 2 per cent. for P. and C.? I would not do it. The wholesale drug people do not make any charge for boxes, packing or cartage, and surely they do as close a business as any Hardware concern, with as much loss in broken bottles, jars, &c., as any Hardware manufacturer. Let the jobber in Hardware consult the drug men and find out the secret of this, and adopt their method, and I will wager a nickel he will find his mail orders larger when once it is found out that he is doing so. When the cost of packing, boxing and cartage is included in a bill of goods, the retailer in marking goods does not have to add to an article a small amount to cover this, and, besides, he wants to know the cost of his goods placed on the sidewalk, for the 2 per cent. cash discount will generally overpay freight charges. Again let me urge my brother retailers to copy after the retail druggists and demand goods f.o.b. They get it, and why should not we? They are organized for self-protection and advancement. I hope this matter may be urged, and kept going until some enterprising jobbing house tries it.

The following suggestion is from a Hardware house in this State, and, if the matter to which it relates is one in which the trade are interested, we shall be glad to hear in reply to our correspondent's inquiry:

The labor question is of such importance that anything on the subject is of interest. We would like to know how much is the average clerk hire for ordinary country Hardware stores like ours—in a place of 10,000. As long as names are not published we do not see why any one should object to giving their expense in the way of clerk hire, as compared to their sales.

A Western Hardwareman alludes with approval to the suggestion made by one of our correspondents that the convenience of the trade would be served if manufacturers of Copper Rivets and Burrs would put up the goods in half-pound assorted packages. He remarks that the manufacturer who first offers the goods in this way will be blessed with an increase of trade.

A Massachusetts Hardwareman refers as follows to a matter of some importance which has not been alluded to by any of our correspondents:

We should be glad if any of your numerous subscribers would give us some system whereby there could be some check to prevent goods being delivered without being charged on the books by the clerk, a carelessness that must be a large expense to every retail house in the country.

The following letter from a dealer in Hardware and Stoves explains itself:

I was quite surprised at seeing my drayman backing up in front of my store with a Heating Stove a few days ago. In the following mail I received a letter from the firm sending the Stove, saying that their representative would be around in a short time to show up the Stove to me. The firm sending it was known to me only by reputation. My trade is in a territory which does not belong to them, and the only thing ever purchased of them was a Grate to a Cooking Stove. The feeling presented itself to my mind that they were too intimate on short acquaintance. A few days after another Stove came in the same way, without any solicitation or knowledge of mine. I then told my drayman to bring no more homeless Stoves unless I saw them first. These sample Stoves have gone into the cellar, and are being held for the freight I paid on them. Is there no help for the retailer, but must he be the recipient of desirable or undesirable Stoves?

With reference to a statement which appeared in the letter of one of our correspondents in our last issue, we have received the following communication from the head of a leading wholesale Hardware house in Kansas, and we take pleasure in laying it before our readers:

To the Editor of The Iron Age: I notice in the Trade Report of June 17 an item of news to the effect that Western jobbers at a meeting at Kansas City decided that Chicago jobbers should not sell Hardware west of the Mississippi. I attended that meeting, and, so far as I know, nothing of the kind was decided. Chicago jobbers might decide that question, but this is supposed to be a free country, and they are supposed to have the right to sell their goods anywhere they can find a market for them.

A correspondent in Chicago, for whom the controversy relating to packing and cartage charges has interest, sends us the following:

Mr. "Scratch Awl" says he is "willing to pay a reasonable price for services actually rendered." Exact cost would, we presume be a reasonable price. The figures given while assumed, are in exact proportion to the actual figures paid in hard cash by the firm referred to for "package and cartage," and the charges made to their customers at the foot of invoices are not duplicated "indirectly" in the price of their goods, very many of which are sold at lower prices than the manufacturer would sell them for in like quantities, or could sell them for, without actual loss.

In reply to his question I beg to say that the "salaries of the men, expenses of horse keeping, &c., are not summed up with rent, clerk hire, &c., and made a part of the cost of goods in that way." The packing and cartage are made a separate department of the business. The capital employed, the salaries of the men engaged, the barn expenses, boxes, lumber, nails, tools, &c., are charged to the department, which is credited with the amount collected from customers, and with an annual inventory of stock remaining on hand. The department almost always loses a little money, because in making charges to customers sufficient account is not taken of delays and accidents incident to business in the crowded streets of a large city, and of the wear and tear to horses, wagons, harness, tools, &c. Their charges are always uniform for the service actually rendered, and as satisfactory to their customers as a charge of any kind would be. The amount of capital employed and business transacted in the department would only be equaled in the largest retail Hardware stores in the country. I object to this method of detecting "petty frauds on the retailer" by percentage of cartage on his bills. A case worth 50 cents will hold $100 worth of Pocket Knives, while it will only hold $2 worth of Tinware. It is impossible to determine actual value of services rendered in that way. It is equally impossible for the jobber to add an equitable percentage covering this item to all his goods and collect it indirectly, as will appear from a comparison of cases required for $100 worth of Tinware and $100 worth of Pocket Cutlery. No charge is made for packing goods shipped in original packages which have been included in the manufacturer's cost of them. The cases from original packages broken up are utilized as far as possible, but they are never charged for at the price of new boxes, while the cost of lumber, nails and labor used in "coopering" them often makes them cost nearly as much as new boxes would.

"Pennsylvania" entertains some very queer ideas, or I do not understand him. His idea is to compel the jobber in some way to diminish his charges for package and cartage, or collect them in some indirect way. I do not doubt the travelers find him a "daisy" to sell goods to, and are compelled, if they gain any profit off their transactions with him, to substitute some indirect charges to get even on concessions of direct charges he forces from them. The Tinware, House-Furnishing Goods and Bird-Cage houses include the cost of package in the price of their goods, and it is a large percentage of their cost. If these houses, after getting pay for their packages, did business on the narrow margin of Western General Hardware houses, they could not live, the volume of business transacted being so much smaller. There are very few houses in the lines mentioned in this country where the capital employed and the volume of business transacted would equal the package and cartage department in the house I have referred to, and the percentage of expenses for packing and cartage included in the price of their goods is probably five times greater.

The "supply houses" he refers to I suppose mean the retail houses who advertise to sell at retail at wholesale prices. They are a sort of "bushwhackers" in legitimate trade, and competitors of both retailers and wholesale dealers. Their stocks are made up of special lines, job lots, fire goods, &c. Their prices are generally above the jobbers' price for goods of like quality, and often below what the small retailer can afford to sell his goods for in a legitimate way. Some of them do a quite successful business, some of them do not; competition with them is impossible unless you go into the same kind of business. Their customers assume some risks they do not assume in trading with the legitimate retailer. "Pennsylvania's" attempts to force jobbers or manufacturers to put him on a footing, so he can make money and compete with them, will fail. He will risk losing his business and make himself odious without gain if he persists in them. His better course is to recognize only the competition in his town, to bear in mind that his neighbor pays the same prices, the same charges for packing and cartage and similar expenses. In making up his cost he should add to each item in his bill its legitimate share of the packing and cartage charged at the foot of his bill, and in fixing his selling price should add a percentage great enough to compensate him for "services actually rendered," store expenses and use of his capital, considering that his neighbor must do the same to make his business successful.

If he will do this he will then conform exactly to the practice of the house I have referred to in its packing and cartage department, and to what I suppose to be the practice in all respectable mercantile houses, whether wholesale or retail. Your Detroit correspondent refers to the over reaching jobber and the unscrupulous and unreasonable retail dealer. For the former, when his tricks appear, it is better to "cross him off the list, he won't be missed." The other fellow don't always know exactly what is just and reasonable, and with some it appears as if

"The more they have their wants increase,
Complaints and cravings never cease."

Just what to do with him cannot be defined in a general rule. Each case requires to be judged on its individual merits. If I find him dishonest I quit him; if merely unreasonable I try to make the reasonable view apparent to him, and if too troublesome I put him on the list and plainly tell him so for the good of his other correspondents.

HAND VS. MACHINE CUT FILES.

The tests in Sheffield which we recently referred to as being arranged for, with a view to determining the relative qualities of machine and hand cut files, have not yet been made. Referring to this matter, and alluding to a contest made several years ago, the correspondent of the *Ironmonger* writes as follows:

While the arrangements are in progress for a *bona fide* test of the relative merits of the two systems of File-cutting, it may be interesting to give the particulars of a private test which was conducted by a large local firm some six or seven years ago, and the result of which had an important influence upon the after policy of the firm with regard to their system of manufacture. Although the test was a private one, it was conducted with scrupulous fairness to both systems of cutting, and the workmen and foremen who had the carrying out of the operation were not permitted to know by which process the Files which they used were cut. I have had an opportunity of inspecting the documents which record the conditions under which the test was made, and the results arrived at, and I append particulars. Twelve 12 inch Hand Bastard Safe-Edge Files were forged and hardened out of the same material by the firm making the experiment. Of these six were cut by hand on the premises, and six were

sent out to be cut by the best machines then available. The Files were stamped 1 to 12, and six were handed to one foreman and six to another, half of each six being machine cut. In the case of the first six two trials were made, the only difference between the conditions observed being that, while in the one case the piece of steel operated upon was so fixed in the vise that it projected 3¾ inches from the end of the vise, in the other the material was grasped in the middle, with the edge raised above the jaws of the vise. The following are the reports of the foreman who conducted the two trials on the first set of six Files :

Files Numbered 1 to 6.—First Trial.

JANUARY 24, 1879.—2500 strokes each File on one piece of cast tool steel, 1 7-16 inches on its edge, projecting 3¾ inches from end of vise :

Mark.	Weight of filings.	State of files.
No. 1	852½ grains	Nearly worn out.
No. 2	808½ grains	Moderately good yet.
No. 3	691½ grains	Nearly worn out.
No. 4	998 grains	Moderately good yet.
No. 5	640 grains	Nearly worn out.
No. 6	723 grains	Moderately good yet.

Nos. 1, 2, 4 and 5.—About the right temper.
No. 3.—Rather soft.
No. 6.—Rather hard.
(All the tests made by the same workman.)

Same Files.—Second Trial.

FEBRUARY 18, 1879.—2500 strokes each on cast tool steel, 6 inches long by 7-16th inch thick, fixed between jaws of vise :

Mark.	Weight of filings.	State of Files.
No. 1	602½ grains	Nearly worn out.
No. 2	576½ grains	Moderately good yet.
No. 3	466½ grains	Nearly worn out.
No. 4	521½ grains	Moderately good yet.
No. 5	561½ grains	Nearly worn out.
No. 6	718 grains	Moderately good yet.

Files Numbered 7 to 12.

No. 7.—Worked on cast iron, one day; nearly worn out.
No. 8.—Worked on wrought iron, four days; very good.
No. 9.—Worked on wrought iron, two days; good.
No. 10.—Worked on steel and cast iron, three days; very good.
No. 11.—Worked on steel and wrought iron, two days; nearly worn out.
No. 12.—Worked on steel cutters, two days; very good.
Nos. 7 and 11.—Would have been more suitable for working brass.

It only remains to be added, to make the result complete, that the odd numbers represented the hand-cut Files, and the even numbers those cut by machine; and that, acting on the issue of the test, the firm by whom it was conducted have since cut the bulk of their Files by machinery.

ARRANGEMENT OF HARDWARE STORES.

The accompanying diagram, Fig. 102, represents the arrangement of George A. Brush's Hardware and Stove store, Austin, Tex. It is situated, as indicated, on a corner lot, 46 x 160 feet. The rear of the lot is 8 feet above the level of the store floor. At the back of the lot is an alley 20 feet wide, which affords convenient access to the rear of the building. It will be observed that there are no show windows at the front. Two of the front doors, indicated in the diagram, are not used. The abundance of light secured in this store is referred to, there being three windows and a door in the rear, two windows and a door in the side, in addition to what the front affords.

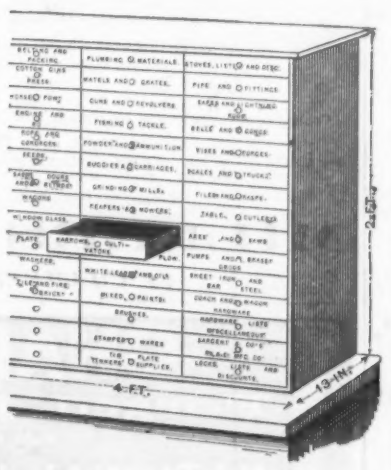


Fig. 103.—Case for Circulars, Price Lists, &c.

The fact that it is very easy to shut out light from a building, and very hard to draw it in, led to the determination in the erection of this building to secure a well-lighted store. The shelving is 10 feet high, and includes a shelf counter. The shelves above the counter are adjustable, being supported by movable slats. The average space between shelves as required for his stock of goods is about 10 inches. Hardware is kept on the right-hand side of the store, entering from the front. Down the center of the store there extends a row of iron columns, being 12½ feet apart. Between these columns there extends a bar the whole length of the store, measuring 1 inch in thickness, with a depth of 6 inches, and being finished with an ornamental cap-piece at the top. This bar is used for suspending Hanging Lamps, Chandeliers, Bird Cages and other goods which can be advantageously displayed in this manner. The tinshop is in the rear of store, to the left, and on the second floor. The stairs leading to it are indicated in the diagram. The sample Stoves are all on platforms, the location of which is shown in the sketch. By this means his stock of Stoves is kept together and in perfect line. The Stoves are in a good light as they stand, and are arranged with aisles between the platforms. The flooring is of hard pine, 1¼ inches thick, tongued and grooved together. The counters and shelving are constructed of Texas pine. White is preferred as a finish for walls. The counters and sides of platforms are stained to imitate walnut. The location of the elevator in the store is indicated in the sketch, and is at the side entrance, through which all heavy merchandise is received. Tin Plates and other similar goods are stored on the lower floor, near the elevator. The latter, among other uses, affords a convenient means of getting material to the tinshop. The general scheme is to keep all the material except Scrap and Wire on the principal floor, taking that only into the shop which is needed for immediate use.

We are indebted to Crane Bros. & Co., Yazoo City, Miss., for the following description of their method of handling circulars, price lists, &c., as illustrated in the accompanying cut, Fig. 102. They refer to it as one which they have used for some time and find entirely satisfactory, and say that by this method they are able to keep posted on every detail of their extensive line, and that they have made many a dollar by being able to answer the many questions in regard to which a Hardwareman is expected to be informed. We doubt not that the description of their method will be of service to many of our readers. In their letter describing it they say :

Inclosed we send you a sketch of our circular case. It is made of ¾-inch lumber in the form represented, with drawers 1¼ to 2 inches deep, made of sheet tin. The front is wider than the body of the drawer, and projects at top and bottom, thus covering the opening effectively and excluding all dust. We have each drawer labeled as indicated. The case is placed on the top of our desk. When a circular is received we consign it to the proper drawer, and if it is a late issue of one from some house represented in the drawer we remove the old one and put the new one in its place. Our catalogues are kept in bookcases. Our tinner made the drawers and soldered in brass rings to pull them open with. The entire cost was about $10 for a case of 91 drawers. When made we varnished the fronts with asphaltum, giving them the appearance of walnut.

Henry A. Winship, Bradford, Vt., a description of whose Iron house was given in these colums a couple of months ago, favors us with the following suggestion in reply to the inquiry as to the management of Light Hoop Iron :

I noticed some time since a question as how to keep Light Hoop Iron. Cut the bands and as nearly as possible straighten the contents of bundle on the floor. Take out one strip and let it double back as before the bundle was cut open; even the ends and double once in the middle; tie with a bit of waste twine in center; then hang up on a long pin or pile on a shelf; so continue till bundle is all disposed of, and you have your Light Hoop Iron in perfect order and in neat little bundles about 4 feet long.

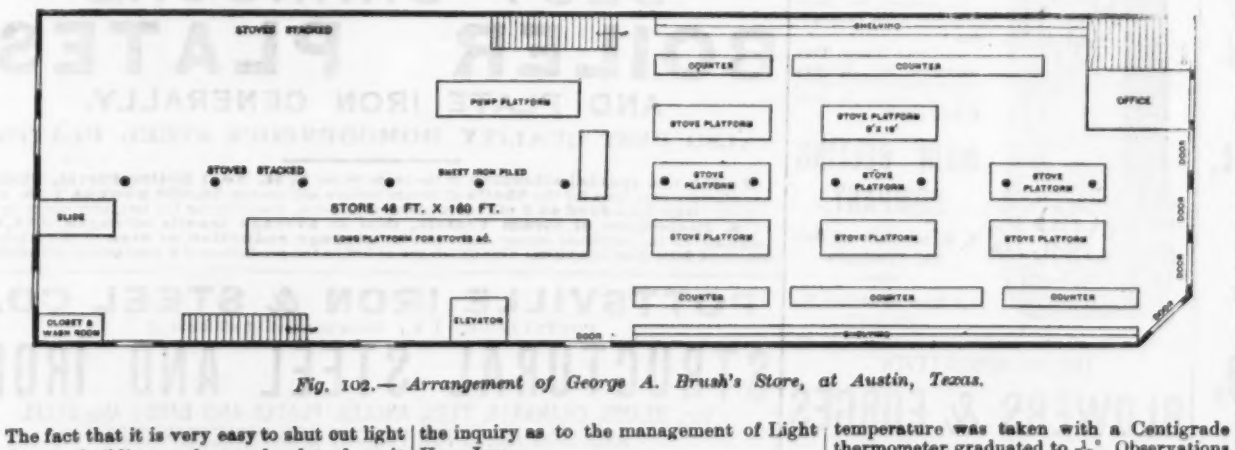


Fig. 102.— Arrangement of George A. Brush's Store, at Austin, Texas.

A Curious Patagonian Port.—The brigantine Georgie, now anchored in the Delaware River, remarked the Philadelphia *Record* recently, has been chartered to load a cargo of hardware and lumber for Port Madryn, Patagonia, a place heretofore unknown to American customs officials. It is believed that the Georgie will be the first vessel to sail from this country for Port Madryn, as the existence of the place is practically unknown in maritime circles. Captain Morris, of the Georgie, says that his vessel will sail for her destination *via* Wilmington, N. C., where the greater part of her cargo will be loaded, after which he expects to be not more than 75 days in reaching his destination. The offer to carry the cargo was made to several shipowners, who refused to even consider the charter, not being willing to risk their lives and property in an unknown country. The settlement of Port Madryn has been comparatively recent. Several years ago a colony of farmers from the vicinity of Cardiff, Wales, decided to leave their native land for the River Plate, expecting to settle along that river; but, finding the Spanish language an insurmountable obstacle to them, the people left for Patagonia. The colony now numbers over 700 souls, and their farms stretch inland for a distance of over 23 miles. The settlers are in constant intercourse with the Indians, with whom they barter tobacco and flour for ostrich feathers and guanaco skins. No American vessel of any kind has ever visited there, and but very few ships from other nationalities have made the port. Lieut. C. B. Brent, of the English war-ship Volage, which visited the place in 1876, described the country as healthy, without fog and very little rain, water being carried from the interior, a distance of 20 miles, on mules. If the settlement continues to flourish, and its existence becomes generally known, it will be a convenient port of call for vessels bound around the Horn.

The Manufacture of Coke in Belgium.

La Semaine Industrielle publishes the following table giving statistics of the manufacture of coke in Belgium in the year 1885 :

Districts	No. of ovens. Active.	No. of ovens. Idle.	Number of men.	Quantity of coal consumed. Metric tons.	Product of coke. Metric tons.	Yield. Per cent.	Average value. Francs per ton.
Mous-Couches. Est	390	190	331	155,933	108,470	69.56	16.05
Mous-Couches. Ouest	420	68	345	284,400	192,125	67.50	14.75
Mons-Centre	1,067	424	385	753,913	570,329	75.65	12.55
Charleroi	566	577	435	415,662	318,010	76.50	13.10
Liège, Rive Gauche	1,020	470	445	494,901	353,085	71.35	13.45
Liège, Rive Droite	270	266	166	187,887	136,456	72.50	12.38
Totals and averages	3,733	2,004	2,307	2,292,696	1,678,475	73.21	13.15

As compared with previous years 1885 stands as follows :

Year.	No. of men.	Coke per diem. M. tons.	Value trans. per M. tons.
1881	2,358	1,834,669	15.98
1882	2,519	2,066,249	17.73
1883	2,474	2,077,051	17.08
1884	2,074	1,812,148	14.87
1885	2,307	1,678,475	13.35

There has therefore been a marked decline, both in product and in prices, during the past two years, in sympathy with the general depression in the iron trade of Belgium.

Calorimetric Tests of Boilers.

At a recent meeting of the Engineers Club of Philadelphia, Mr. J. E. Codman presented a paper on "Calorimetric Tests of Boilers," from which we take the following :

Tests for the quality of steam furnished by three different forms of boilers in common use in Philadelphia were made for the purpose of obtaining data to be used in the selection of additional boiler capacity. The apparatus used for determining the quality of steam was a wooden barrel, large enough to contain about 230 pounds of water, constructed for the purpose, the depth being considerably more in proportion to the diameter than usual. The steam pipe was carried to the bottom of the barrel, and a number of small holes drilled in the side, the end being plugged up. A side attachment was made by which the steam could be blown through the pipe before turning into the barrel. The barrel was placed on a scale weighing to ¼ ounces, and 200 pounds of water and 10 pounds of steam used. The temperature was taken with a Centigrade thermometer graduated to $\frac{1}{10}$°. Observations were taken every 15 minutes, and the condition of the fires, running of the engine and other notes were made at the same time. It was found that the loss from radiation of the mixture was inconsiderable, as the temperature did not fall more than $\frac{1}{10}$° C. in five or six minutes.

The first series of tests was made on the plain cylinder boilers, 30 feet long and 4½ feet diameter, to the bottom of which were attached two mud drums, 22 feet long and 28 inches in diameter. Boilers and mud drums were set in brickwork, and externally fired. The quality of steam obtained from these boilers varied greatly according to the condition of the fires and hight of water in boilers. The greatest per cent. of moisture was 17 per cent., with fresh fires and the water above the average hight, reducing the steam space 30 per cent.

The second series of tests was made on what is commonly called the double-deck form of boilers. The lower cylinder was 6 feet in diameter and 12 feet long, containing 92 4-inch tubes. The upper cylinder, 4 feet in diameter and 13 feet long, connected to the lower cylinder by three necks 14½ inches in diameter and 9 inches long. Boilers and drums were set in brickwork and externally fired. The heat and flame passed under the lower cylinder and through the tubes to the front of the boiler and returned under the upper cylinder to the stacks. Samples of steam for the test were taken out of the 14-inch main steam-pipe leading to the engine, about 60 feet from the boilers. The attachment for samples of steam was made with a 1½-inch pipe, about 12 inches long, cut in half longitudinally, tapped into the side of the steam-pipe and carried inside so as to reach nearly across the pipe. A 1½-inch stop-valve was placed in this pipe, about 8 inches from the outside of the main steam-pipe. Beyond this the pipe was reduced to one-half diameter, and continued to the barrel.

Tests were made every 15 minutes during the day, and a sufficient number were taken under the varying conditions of cleaning fires, high and low water, and high and low steam, to give a fair sample of the average quality of the steam furnished in the ordinary working of the boiler. It was noted that in no case was the change of condition in the boiler followed immediately by a change in the quality of the steam, an interval of from 30 to 45 minutes elapsing before the steam changed. This was no doubt due to the fact that the boiler capacity was far in excess of the amount required to run the engine.

The third series of tests was made on the marine tubular boilers, 10 feet 10 inches long and 11 feet 6 inches in diameter, containing two corrugated furnace flues and 188 3-inch tubes, with one steam drum 3 feet 6 inches in diameter and 12 feet 6 inches long, connected to two boilers. These boilers are internally fired and so arranged that the escaping gases pass off through the tubes and under the drum before entering the stack. Ten boilers were running and supplying steam for two 15,000,000-gallon Worthington pumps. Steam for samples was taken from the main steam-pipe, about 15 feet from the boilers, and connection was made with a 2-inch pipe and stop-valve, reduced to ½ inch about 2 feet from the main pipe and continued to the barrel. Steam from these boilers was found to show but slight variation, ranging from 9 to 6 per cent. of moisture. The average of all the tests for each kind of boiler was found to be for the

	Per cent.
Cylinder	4.05
Double-deck tubular	4.66
Marine tubular	6.91

Comparing the results as given in the annexed table it is found that the cylinder boilers, driving to their full capacity, still furnished a fair sample of steam, while the double-deck boiler, doing only one-third capacity furnished an average quality of steam, and the marine boilers, doing nearly the full capacity, furnished steam containing 2¼ per cent. more moisture than either of the other two furnished. Comparing with the evaporative efficiency of 5 pounds of water per pound of coal at given pressure and temperature for the double-deck and 6.3 for the marine boilers, and allowing for the 2¼ per cent. more of moisture in the steam, the marine boiler will give 24 per cent. better results than the double-deck.

Comparing this with amount of work performed, it is found the marine boilers were doing 43 per cent. more work, showing an advantage in favor of the internally-fired marine boilers, both in evaporative efficiency and quantity of steam furnished. In comparing the amount of steam furnished by each kind of boiler the steam was computed from the indicator cards for double-deck and marine boilers, taken from the engines running at the time the tests were made. This, therefore, accounts for the small figure of evaporation given in the table, as only about 75 per cent. of the steam can be accounted for by the indicator card. For the cylinder boilers it is from the actual amount of water weighed and pumped into the boilers. Therefore no comparison on the same basis can be made with the other boilers.

Comparison of Results Between Marine and Double-Deck Boilers.

	Per cent.
Difference in favor of double-deck boiler in quality of steam	2.25
Difference in favor of marine boiler in economic evaporation in pounds	1.95
Less 2.25 per cent. for moisture in steam pounds	1.92
Per cent. in favor of marine boiler in economic evaporation	24.
Difference in favor of marine boiler in water evaporated, per square foot of heating surface, in lbs., 0.4 per cent.	43.

Note.—Same quality and size of coal used under all the boilers during the tests.

Dogwood.—Concerning dogwood we find the following particulars in the *Lumberman's Gazette* : "In an economic point of view the wood possesses many valuable qualities, and for this alone it would be well worth growing. It is, in fact, a beautiful wood in grain and texture. It is hard, tough, fine-grained and heavy, its specific gravity being 0.8153. In color it is nearly white, slightly reddish at the heart. It has a beautiful satiny appearance, and takes a high polish readily. The medullary rays are numerous and conspicuous. It is an excellent wood for turning. As an amateur I have frequently used it in the lathe, and always with the greatest satisfaction. I know of nothing superior to it for this purpose in our American woods. I have often wondered that it was not used by engravers to a greater extent than it is, although I am told it is already employed for woodcuts quite largely. It seems well adapted for machinery bearings, and I should think it would make excellent wagon hubs. For tools and all manner of handles and mallets it has no superior. There is a tendency toward checking during the process of seasoning, however, especially in large blocks, which needs some care to overlook or prevent. But this is very apt to be the case with all hard, close-grained woods."

An oven shelf which is automatically drawn out by opening the oven door has been patented by Mr. Armington, of Spring City, Pa. The shelf travels on guide rails attached to the sides of the oven, and is provided at its lower face with an open cam. A hook on the door engages this cam when the door is opened and draws the shelf out about half its length. At this point the hook becomes disengaged and the door may be further opened without drawing the shelf out too far. On closing the door the hook again engages the cam and pushes the shelf into the oven.

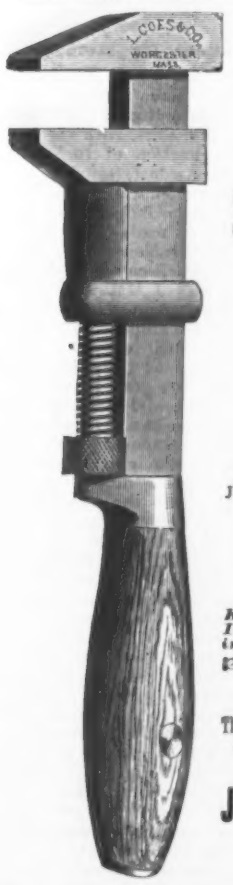
SCIENTIFIC AND TECHNICAL.

A Boiler Furnace for Refuse Fuel.

MM. Albin & Co., a firm of French mechanical engineers, have made a successful study of the construction of gas generator furnaces for steam boilers, with special reference to the utilization of fuels of poor quality—such as sawdust, tanyard refuse, &c. Their arrangement is described and illustrated in the *Revue Industrielle*, together with a record of tests made under the supervision of M. Walter Meunier, chief engineer of the Alsatian Steam Users' Association. The principles of MM. Albins' system consist in the employment of a tubular cylindrical boiler of considerable diameter in proportion to its length, a spacious steam dome, and an inclined fire-grate supplied with hot air. The fire grate is stepped with a double tier of horizontal bars placed crosswise of the furnace at a slope of 45°, thus permitting a large volume of air to traverse over and through the combustible. The cold air enters in the first place through flues placed alongside the smoke-flues on their way to the chimney, and it is finally led to the front of the double row of bars, which are, of course, closed in from access of fresh air. The whole of the boiler, with the exception of the steam dome, which projects, is inclosed in the setting, and surrounded with flues. The clinkering of the fire-bars is managed by a mechanical attachment which rocks them and slices off the clinker. The charge of raw fuel is in the first place deposited upon a flap door, which can be laid horizontally to receive it, and when loaded is turned over, so as to project the charge into the furnace and at the same time to close the opening. Every care is taken to properly ignite the gas before admitting it in direct contact with the boiler plates, and afterward to make the contact as intimate as possible. Tested with logwood refuse containing 8.64 per cent. of ash and 50 per cent. of water, a boiler of this kind kept steam at an average pressure of 5.64 atmospheres, showing a duty of 1.41 kg. of water at 0° C. for the wet fuel, and of 3.09 kg. for the dry fuel. With sawdust containing 31 per cent. of water there was a duty obtained of 2.08 kg. of water at 0° C. for the wet fuel, and 3.02 kg. after reduction to the equivalent of dry fuel. The mean temperature of the waste gases at the point of entry into the chimney was from 141° to 161° C. The stoking was done with great ease, and the clinkering did not offer any difficulty. Considering that the furnace only requires charging at most every 20 minutes with the light refuse used as fuel, the labor of attending these boilers is such as the most inefficient native workman can furnish, while the fact that the fuel is used without any preliminary drying, even for tanyard refuse, renders the system valuable for isolated factories. The same arrangement burns breeze and dust coal.

Is Tin Plate an Alloy?

The conditions under which the iron and tin exist together at the surface of a tin plate has provoked much dispute. To some it is an alloy, while others are certain that the tin simply coats the surface, and, if traces of the metal are found at any distance within the body of the plate, its presence is accounted for by the tin penetrating the minute interstices of the iron. But they claim that no such intimate mixture exists as is necessary to the constitution of an alloy, for, even if these two metals are capable of becoming alloyed one with the other when molten, the condition of the iron, which is put cold in the bath, precludes that possibility. The tinning-pot itself is cited as a sufficient argument that no alloy is formed, for, if the surface of the pot were alloyed, the iron would, as it were, dissolve away under the action of the melted tin, adulterating the bath, and eventually become honeycombed. Roughly speaking, the difference between the melting points of iron and tin is 1000° F., and how, it is asked, could the iron be affected by contact with a metal which becomes fluid at so low a temperature? We do not know that the subject has ever been carefully investigated by competent scientists, and are doubtful even whether the average chemist would not find in it a problem beyond his power to resolve. Roscoe and Schorlemmer, in describing the manufacture of tin plate, state that the iron sheet "is brought into a vessel filled with melted tin covered with a film of oil, an alloy of tin and iron being thus formed." As this description, which occurs in the chapter on tin, is very brief and only incidental to the main subject, it is possible that the authors simply quoted some older authority without previously determining whether the statement was strictly accurate or not. As an offsetting argument to the one that iron and tin do not alloy in a tin plate because the temperature is far too low to melt iron, reference may be made to the case of lead and platinum, whose temperatures of fusion are still further apart. It is a phenomenon familiar to many, if not all, who have worked in a chemical laboratory that if lead or even certain of its salts be melted in a platinum crucible the result will be most disastrous so far as the integrity of the crucible is concerned. Directly the lead fuses it alloys with the platinum, and runs through the bottom of the crucible as if it were made of tissue paper. Instancing this case in support of the view that iron and tin alloy at the surface of a tin plate is only reasoning by analogy, and is consequently inconclusive. Because lead and platinum fuse together at a temperature far below the melting point of the latter, it by no means necessarily follows that iron and tin will act the same under similar conditions. Whether the surface union of the two metals takes place as a film of alloy, or whether the iron and tin are distinct and separate, is of little importance so far as the wearing qualities of the plate are concerned; for one thing is certain, that under whichever conditions the metals exist the contact between them is sufficiently intimate for all practical purposes. It seems strange, however, that as much doubt can exist about so simple a matter, particularly as tin plates may be said to be as old as the science of chemistry itself.



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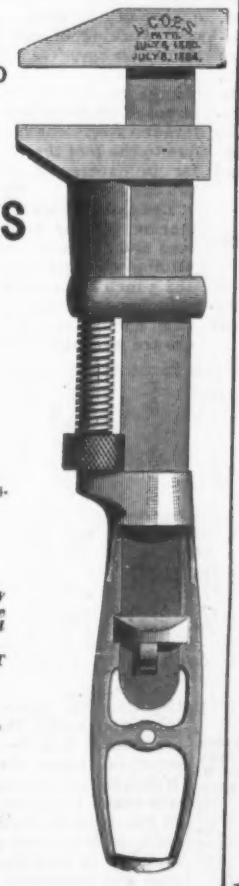

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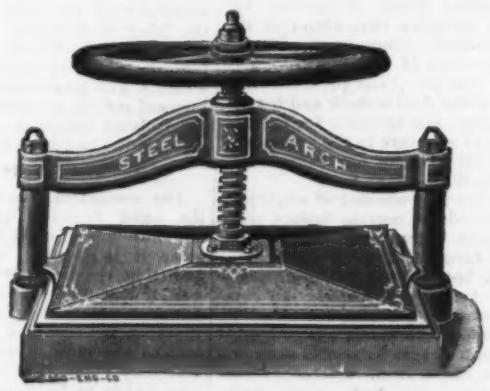

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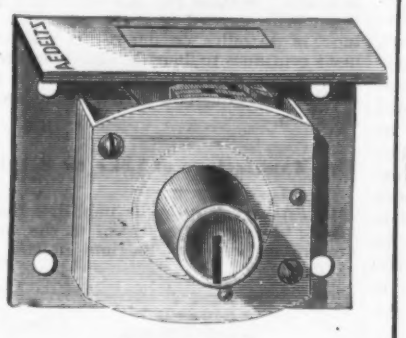

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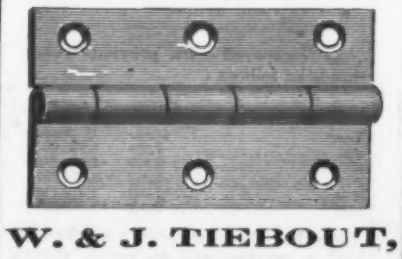

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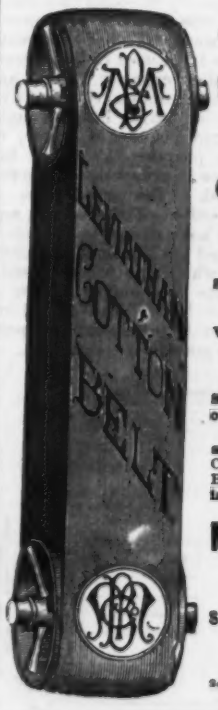

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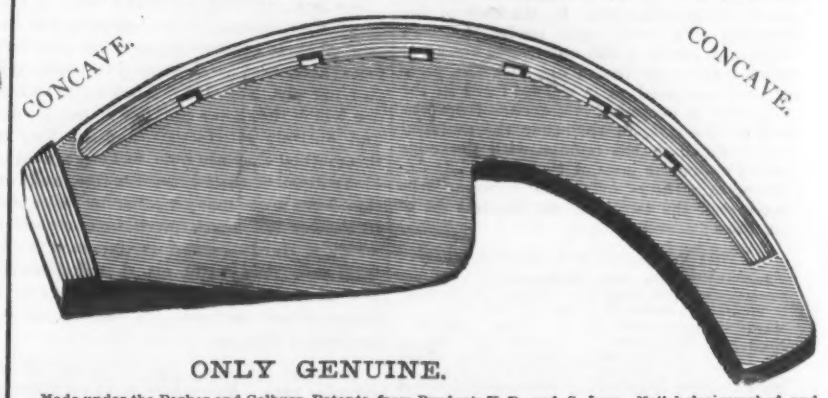

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No. 1, Full Length, Concave, 5 inches, Weight, per Set of Eight Shoes, 3 pounds.									
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" 3,	"	"	6	"	"	"	"	4	"
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This Steel is manufactured by the CLAPP-GRIFFITHS process, and is specially adapted, in addition to the above, for Boiler and Bridge Rivets, Wire Rods, Nail Plates, &c &c. Our Mild Steel is well adapted for use in place of the best quality of Wrought Iron; where a greater strength and ductility is required, it welds readily as Iron. Also Billets, Slabs of all sizes and any desired temper. Shafting of all sizes in stock, from which prompt shipments can be made.

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Harness Hooks. Ceiling Hooks. Flower Pot Brackets. Sash Fasteners. Slabs and Plates. Paper Weights. Pump Spouts. Boot Jacks. Blower Stands. Shovels. Pokers. Tongs. Wash Boiler Handles. Sad Iron Stands. Post Mank. Wagon and Carriage Mails. Tobacco Cutters.

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THE WEEK.

Divers at work on the sunken Oregon report that the wreck is fast going to pieces from the action of the currents and swelling of the cargo in the hold. The iron masts are still firm in their places and assist the divers in their descent. They expect to continue the work all summer. Excepting a few bales of carpeting, cotton cloth and india-rubber, the goods recovered are of little value.

Gen. Alexander Shaler was formally removed on Friday by Mayor Grace from his office as president of the Board of Health. The Governor must approve the Mayor's action before it becomes operative.

The franchise of the United States Heating and Power Co., including nearly 1 mile of pipe down town, east of Broadway, was sold to N. J. Newikee for $4700.

An extensive frontage on the lake at Painesville, Ohio, has been secured in the interest of the Baltimore and Ohio Railroad as a western outlet for coal, and extensive contracts for iron ore are said to have been made with firms in Johnstown and with Ward's Transportation Line.

An African line of steamers to ply between Baltimore and the Congo River has been incorporated at Washington, with a proposed capital of $2,000,000. Henry Cox is president. If Europeans can find profitable trade on the African Coast, why not Americans?

There landed in the United States during the 11 months ending May 31 284,274 immigrants, as compared with 306,902 in the corresponding period in 1884–85. There is less immigration from Germany, but more from Sweden and Norway; from the United Kingdom about the same.

Twenty-nine postal clerks of the railway mail service were removed from roads in the Northwest for insubordination in conspiring to obstruct the regulation of the service by the Post Office Dypartment and to injure its efficiency. General Superintendent John Jameson says: "They have secretly attempted to form an association with a view to dictate action to the department, and many of them have also been guilty of deception toward their fellow-clerks by representing the purpose of such association to be merely benevolent, and thus entangling them."

A street parade of the various trades in New York, July 5, is being arranged by the Central Labor Union.

Mr. Powderly, in an interview with a reporter, discussed the question of convict labor in its bearings upon the Knights of Labor. Being informed that convicts were doing the stonework on the county prison, he stated with quiet drollery that, "if the managers of these institutions will persist in using convict labor in erecting their buildings, I would suggest that the Knights of Labor place a rigid boycott upon all such institutions by withdrawing their patronage and remaining out of them."

The editor of the Philadelphia *News* is ecstatic over his discoveries of natural gas in Pittsburgh. He says it was not until three years ago "that the slow manufacturers of that city awakened to a realization of the fact that they had within reach the greatest natural power that man had ever dreamed of; greater than electricity and greater than steam, because it is more utilizable than the one and more powerful than the other. So wonderful is their new resource that by this time I believe the most progressive among them appreciate the fact that they are on the verge of a complete commercial revolution, and that within 10 years Pittsburgh will be the greatest manufacturing city in the world." The writer estimated the increased productive power of the rolling mills in Allegheny and Pittsburgh at fully 25 per cent. as a consequence of the gas discoveries, and the quality of steel made is unsurpassed.

The president and general manager of the Canadian Pacific Railroad are reported from Halifax to contemplate the selection of that port for their Atlantic terminus, and to run fast trains to the Pacific terminus in 120 hours. They also count on securing the tea trade of the continent by means of their Pacific steamers.

It is said that 800 of the 1300 strikers on the Third Avenue Railroad who went out more than two months ago are unemployed, and many of them in a condition bordering on starvation. President Lyon insists that the boycott must be declared off before he can listen to overtures for re-engagement.

The first American establishment for the exclusive manufacture of edged tools was founded in 1826 by Samuel Collins, of Collinsville, Conn. The forging and tempering of eight broadaxes were the product of a day's labor.

The new steamship La Bourgogne, Captain Frangeul, from Havre, which arrived in New York on Saturday, made the passage in the remarkably quick time of seven days, five hours and eight minutes mean time, the fastest passage on record between the two ports, her average speed being a little over 18¼ miles per hour. She resembles the Etruria, of the Cunard Line, which has surpassed all others in fast sailing, as respects her general dimensions, except that she has less beam by 8 feet, although not quite so long. The French builders, therefore, believe in narrow ships and a sharp prow. La Bourgogne is 508 feet long, 52 feet 2 inches wide and 38 feet 4 inches in depth of hold. She is moved by one 26-ton propeller, 22 feet 8 inches in diameter, and has a maximum of 8100 horse-power. The metallic parts of her hull are made of the first quality of steel. She is rigged with four metal masts, and her sails are hoisted and lowered by steam power. The entire expense of building La Bourgogne was $1,775,000, nearly three times as much as any other vessel in the French merchant marine. She registers 7000 tons.

To Japan by rail is the latest project. Major Powell, superintendent of the Geological Survey, in a report to the Secretary of the Interior, advocates a bill to facilitate the settlement and develop the resources of Alaska, and to open a commercial route between the United States and Japan. Major Powell says that a railroad is feasible over the vast intermediate territory, and that the difficulties to be overcome are not greater than have already been mastered in constructing the transcontinental roads already in operation. He says the distance from Northern Montana to Behring's Sea is 2800 miles. This distance, for convenience, he divides into three parts, as follows: First, from some point on the Northern Pacific Railroad in Montana to the head waters of the Peace River; second, from the head waters of the Peace River to the head waters of the Yukon; third, from the head waters of the Yukon to some point on the shore of Behring's Sea.

A new dirigible balloon of colossal dimensions, says the *Deutsche Heeres Zeitung*, is now in the course of construction in Berlin. The inventor, Herr Gaswindt, hopes to overcome the grand difficulty in aeronautics—the attainment of a speed greater than the average velocity of the wind—by the enormous size of his balloon. A series of meteorological observations, extending over several years, has shown that near the earth the velocity of the wind in the temperate zone rarely exceeds 12 m. per second, and Herr Gaswindt expects to attain a speed of not less than 14 to 15 m. A sum of 200,000 marks, it is said, has already been offered for the patent. The balloon is 150 m. in length and 15 m. in diameter, with a capacity of 18,000 c. m., about 10 times as great as that of the Renard and Krebs balloon. The total weight is about 43,000 pounds, the envelope and netting alone representing 10,000 pounds. The propelling machinery consists of two steam engines of 50 horse-power each. The cost is estimated at 100,000 marks ($50,000).

The operation of the railways in New Jersey last year was attended with an unusual number of casualties. The Pennsylvania heads the list with 82 killed and 393 injured out of a total of 201 killed and 526 injured.

The Maine Steamship Co., of Portland, have contracted with the New England Shipbuilding Co, Bath, for a new wooden steamer 220 feet long and of about 1500 tons net register, to make the trip between New York and Portland in 24 hours. The new steamer will be supplied with every modern improvement.

The El Monte, a new steamer for the Morgan Line, was launched at Wm. Cramp & Sons' yards, Philadelphia, on Saturday last, and will be put on the line in September. The El Monte is 351½ feet in length, 42.8 feet beam and 32½ feet depth of hold. When laden she will draw 22 feet. The carrying capacity will be 9000 bales of cotton. She is not built to carry passengers, but will have one large room built especially for the storage of mail matter, powder and specie. She will be supplied with a compound engine of 2400 horse-power, and will be rigged with four iron masts, and have all the latest improvements in steam steering gear, windlasses, capstans, &c., and six patent adjustable steam hoisting machines for handling cargo.

The new building for the Consolidated Stock and Petroleum Exchange, to be completed near the lower end of Broadway, has been leased for five years, at the yearly rental of $110,000, with privilege of 15 years' renewal, and of purchasing at any time within the said first five years of said lease for $1,500,000. The dimensions of the building are 80 x 200 feet.

A member of the Fruit Growers' Association of the United States claims to have invented a cheap evaporator suited to general use which is far more effective than the more expensive description. The process is complete in from two to three hours. The evaporator is a marvel of simplicity, and can be made by any one at a very trifling cost. By its use millions of dollars can be saved the producer and consumer each year

The National American Shipping League effected a permanent organization in Washington last week. The avowed purpose of the organization is to influence public sentiment, Congressional elections, &c., in the interest of legislation dictated by the shipping interest. The delegates were mainly interested in the bounty and subsidy propositions, but had little hope of either in the present Congress. The following officers were elected: Dandridge McRae, of Arkansas, president; Ambrose Snow, of New York, first vice-president; L. M. Merritt, of Florida, second vice-president; Charles S. Hill, of Washington, secretary, and A. Vanderbilt, of New York, treasurer.

It is said that Mr. Edison has decided to remove his entire plant from this city to the McQueen Locomotive Works, at Schenectady, which he has recently purchased.

The finest piece of masonry in Western Pennsylvania is said to be Lock No. 4, on the Monongahela River, between Monongahela City and Brownsville. It will have cost, when completed, upward of $200,000, and will accommodate the rapidly-increasing traffic on the Monongahela for decades to come. The lock is 230 feet long, with a passageway of 225 feet. It is 56 feet wide between the walls, which are 15 feet thick. There are 875,000 feet of timber in the structure below the water.

Valuable lead discoveries are reported at New Diggings, Wis.

Fish Commissioner Blackford, in co-operation with the Larchmont Club, has taken means effectually to prevent the dumping of garbage in Long Island Sound.

The French Chamber of Deputies last week voted decisively in favor of placing a tax on foreign grain. As shipments of corn and wheat from New York alone to French ports amounted to near 8,000,000 bushels during the 10 months ending April 30, Americans are interested.

The Pennsylvania Railroad Co., according to report, intend building large docks at South Chicago, to secure the lumber trade.

A circular has been sent to each of the iron molders' unions throughout the country asking them to consider the advisability of throwing the International Union of Iron Molders bodily into the Knights of Labor, and be prepared to vote on the subject at the next national convention. The Iron Molders' Union is about the oldest, and was formerly the strongest, labor organization in the country. Its membership numbers to-day over 100,000 men.

A reorganization of the National Board of Fire Underwriters is contemplated as a result of the anniversary meeting in this city, July 20.

The Indian Commissioners very sensibly suggest to the Senate Committee on Indian Affairs that hardware would be a good substitute for rifles in attempting to civilize the frontier savages. In regard to Montana the report says: "Nothing is wanting except the necessary implements and the proper direction and encouragement to make the Crows entirely self-sustaining. But, while so deficient in implements and labor, the Crows are well supplied with the most costly and improved firearms. There is no game and these arms ought to be taken and exchanged for the tools of peace."

The Columbia River canneries number 92, and last season's shipments comprised 569,750 cans, while for the whole Pacific Coast the packs amounted to 835,700 cases. For the same year in California the fruit canneries alone packed 565,700 cases, making a lively demand for tin plates.

The natural-gas *furor* continues without abatement in Pennsylvania and Ohio, where lines of pipe are being laid down and wells drilled. A 17-mile line is being laid from Butler County to Allegheny on the surface of the ground. The Philadelphia Co. are drilling 12 wells in the Murraysville region. Another company are boring eight wells. Eastern syndicates have been formed to develop natural gas all through the Ohio Valley for manufacturing and domestic purposes.

A palace to cost $250,000 exclusive of the ground occupied will be built in Washington City for the Chinese Legation. It will be after the fashion of a mandarin palace, surrounded by a wall, and occupy an entire block in the most elegant part of the city. Carpenters and masons from China will do the work.

The United States minister to Spain, Mr. Curry, acting under instructions from Secretary Bayard, has secured important concessions in favor of American shipping. Hereafter both domestic and foreign products imported into Cuba and Porto Rico in American bottoms will be admitted on the same terms as if imported in Spanish bottoms. All goods imported in American ships will pay by this royal order only third column duties.

The 30th of June was the date of departure from Bremen of the first steamer of a new subsidized line from Bremen to Australia.

The Chesapeake and Ohio Railroad have been leased by the Newport News and Mississippi Valley Railroad, and will hereafter be operated as part of that line, running to New Orleans, and make connections with the Huntingdon system for the Pacific Coast. The Louisville Southern, a new road to compete with the Louisville and Nashville from Louisville south, refused an offer of $200,000 from Springfield, Ky., to induce the new line to run through that place. The Louisville and Nashville Railroad quickly accepted the offer, and are under contract to speedily build a line of railway to that place, running regular trains, thus throwing out a feeder into a new field altogether.

Imports.

The following were the Imports of Hardware, Iron, Steel and Metals into the Port of New York for the week ending June 30, 1886:

Hardware.

Boker Hermann & Co.
Mdse., cs., 3
Barbour Bros. Co.
Mach'y, pkgs., 9
Brown W. & Co.
Stoves, pkgs., 75
Cotterel C. B. & Son,
Mach'y, cs., 2
Curley J. & Bro,
Cases, 6
Davies, Turner & Co.
Plates, cs., 5
Dolge Alfred,
Mdse., cs., 12
Drexel, Morgan & Co.
Arms, cs., 28
Field Alfred & Co.
Anvils, 10
Cutlery, cs., 12
Cask, 1
Folsom H. & D.
Arms, cs., 13
Gerdon Otto,
Bells, 800
Graef Cutlery Co
Arms cs., 16
Grubb J. C. & Co.
Arms, cs., 16
Hartley & Graham,
Arms, cs., 8
Hubbell & Randall,
Cases, 4
Jennings A. G.
Mach'y, pkgs., 8
Kastor A.
Case, 1
McCoy & Sanders,
Cases, 2
Moore's Son, J. P.
Mdse., cs., 7
Guns, cs., 12
Pim, Forwood & Co.
Buckets, pkgs., 49
Shoverling, Daly & Gales,
Arms, cs., 6
Schutte W. & Co.
Cases, 8
Shedon Geo. W. & Co.
Cases, 16
Smith A. & Sons,
Mach'y, cs., 30
Gavin M. A.
Mach'y, pkgs., 2
Stoddard, Lovering & Co.
Mach'y, cs., 35
Sturgis Appleton,
Mach'y, cs., 7
Teft, Weller & Co.
Cases, 3
Vandertoorn W. H.
Arms, cs., 27
Vom Cleff & Co.
Mdse., cs., 15
Wiebusch & Hilger,
Arms, cs., 14
Anvils, 415
Witte John G. & Bro.
Needles, case, 1
Guns, cs., 20
Cases, 10
Zimmern Henry,
Tools, cs., 2

Iron.

Alexandre F. & Sons,
Tubes, 50
Brockner & Evans,
Wire net'g. rolls, 176
Baring Bros. & Co.
Bars, 14,033
Bundles, 336
Nail rods, coils., 339
Brown Bros. & Co.
Coils, 857
Cary & Moen,
Rods, cks., 13
Rods, bdls., 78
Coddington T. B. & Co.
Sheets, bxs., 36
Sheets, bdls., 574
Bars, 30
Crocker Bros.
Pig, tons, 300
Spiegel, lot, 1
Spiegel, tons, 1116½
Davies, Turner & Co.
Case, 1
Cask, 1
Pkgs., 3
Kessler & Co.
Scrap, lot, 1
Lilienberg N.
Bars, 3838
Pkgs., 25
Mickerts Oscar,
Wire, casks, 14
Morton, Bliss & Co.
Galv'd sheets, bdls., 205
Sheets, bxs., 5
Naylor & Co.
Spiegel, tons, 200
Pig, tons, 820
Perkins Clarence,
Spiegel, tons, 804
Ferromanganese cks., 286
Plock & Co.
Rivet rods, coils, 199
Pim, Forwood & Co.
Galv'd sheets, cs., 20
Stetson Geo. W. & Co.
Pig, tons, 150
Ward Jas. E. & Co.
Old scrap, tons, 450
Order,
Girders, 354
Rods, bdls., 6074
Wire rods, bdls., 1467
Spiegel, tons, 460
Old rails, pcs., 679
Pig tons, 388
Old iron, tons, 600

Steel

Abbott, Jere & Co.
Cases, 29
Wire coils, 85
Cary & Moen,
Rods, bdls, 2108
Curan John
Pkgs., 8
German Bank of London,
Hoops, bdls., 5200
Heyn Alf.
Rods, bdls., 213
Kessler & Co.
R'way tires, pcs., 284
Merch. Disp. Co.
Bundles, 56
Wagner W. F.
Bundles, 178
Plates, 15
Bars, 67
Cases, 15
Order,
Crucible blooms, 49
Rods, bdls., 12,688
Old spring, tons, 50
Wire coils, 11,222
Hoops, bdls., 4200
Plates, cks., 4
Bars, 6
Cases, 30
Casks, 3
Tubes, pkgs., 4
Billets, 12,250

Metals

Am. Express Co.
Tin plates, bxs., 26
Tin plates, pkgs., 7
Brown Bros & Co.
Plumbago bdls., 863
Tin plates, bxs., 660
Bruce & Cook,
Terne and black plates, bxs., 1396
Terne plates, bxs., 300
Tin plates, bxs., 273
Baring Bros. & Co.
Tin plates, bxs., 946
DeMilt H. R. & Co.
Tin plates, bxs., 355
Dickerson, Van Dusen & Co.
Tin plates, bxs., 265
Fedde Gabriel,
Fog horns, cs., 2
Phelps, Dodge & Co
Tin plates, bxs., 19,487
Black taggers, bxs., 100
U. S. Dispatch,
Fog horns, cs., 2
Wheeler, Fellows & Co.
Tin plates, bxs., 541
Order,
Tin plates bxs., 35,302
Tin ingots, 700
Tin, bdls., 6
Tin and terne plates, bxs., 887
Tin, slabs, 1201
Tin, bxs., 9
Spelter plates, 10,410
Black taggers bxs., 100
Tin and terne plates, bxs., 400
Plumbago, bbls., 1780

The imports of Cutlery, Hardware and Metals at this port for the week ending June 25 were as follows:

	Quantity.	Value.
Anvils	194	$1,386
Brass goods	26	1,439
Bronzes	19	1,804
Chain and anchors	25	1,213
Clocks	171	8,564
Copper	....	34,232
Cutlery	165	42,420
Dutch metal	1	106
Guns	104	18,553
Hardware	9	246
Iron, pig, tons	855	9,105
Iron, sheet, tons	21	1,444
Iron, spiegel, tons	1,104	31,062
Iron ore, tons	2,882	4,352
Iron, tubes	172	104
Iron, other, tons	1,476	40,852
Lead, pigs	2,191	8,067
Machinery	235	12,250
Metal goods	250	25,111
Nails	1	4
Needles	15	5,425
Nickel	11	4,579
Old metal	....	336
Platina	1	2,998
Plated-ware	16	532
Pins	17	1,733
Regulus antimony	75	3,484
Saddlery	21	2,589
Steel	41,618	44,073
Tin, bxs	48,559	186,115
Tin, 1,000 slabs; 112,407 lb	....	23,597
Wire	213	3,648
Zinc, lb	93,416	3,608
Zinc oxide	650	5,412

The London *Iron Trade Exchange* reports that three prominent members of the South Staffordshire iron trade will shortly sail for Alabama to inspect some extensive mineral properties on behalf of a company which is being formed for the purpose of developing the estates. The gentlemen referred to are Mr. Joseph H. Pearson, of Hansworth, the owner of Netherton and Windmill End furnaces, near Dudley; Mr. Benjamin Round, of Hange Furnaces, Tividale, and Mr. Samuel Dickinson, of Wolverhampton, the local agent of the Barrow Steel Co. Mr. Pearson is intimately acquainted with both the manufacturing and commercial sides of the trade, and both he and Mr. Round are colliery proprietors as well as ironmasters. Mr. Round is one of the most thoroughly practical, yet scientific, iron smelters in the Black Country, and Mr. Samuel Dickinson's long experience in the commercial branch of the trade ought to prove valuable when considering the nature and extent of the markets for Alabama pig iron.

Within little more than a year all the locomotives on the St. Paul and Duluth road (43) have been changed from wood burners to coal burners, though it is almost a continuous forest along the road.

Current Hardware Prices, June 30, 1886.

HARDWARE.

Ammunition.
Caps, Percussion, ℘ 1000—
Hicks & Goldmark's
F. L. Waterproof, 1-10's....50¢ } dis 25@25&5 %
E. B. Trimmed Edge, 1-10's....65¢
E. B. Ground Edge, Central Fire, 1-10's. 70¢
Double Waterproof, 1-10's....$1.40
Musket Waterproof, 1-10's....50¢
G. D....28¢
S. B....30¢
Union Metallic Cartridge Co.
F. C. Trimmed....50¢ } dis 25@25&5 %
F. L. Ground....65¢
Cen. Fire Ground....70¢
Double Waterproof....$1.40
Double Waterproof, in 1-10's....$1.40
S. B. Genuine Imported....45¢
Eley's E. B....56¢
Eley's D Waterproof, Central Fire....$1.60
Cartridges—
Rim Fire Cartridges....dis 60&2 %
Rim Fire Military Cartridges....dis 15&2 %
Cen. Fire Cartridges, Pistol and Rifle....dis 40&2 %
Cen. Fire Cartridges, Military & Sporting..dis 30&2 %
Blank Cartridges, except 22 and 32 cal., an additional 10 % over above discounts.
Blank Cartridges, 22 cal....$1.50, dis 2 %
Blank Cartridges, 32 cal....$3, dis 2 %
Primed Shells and Bullets....dis 25&2 %
B. B. Caps, Round Ball....$1.60, dis 2 %
B. B. Caps, Conical Ball, Swaged....$1.75, dis 2 %
Primers—
Berdan Primers, all sizes, and B. L. Caps (for Sturtevant Shells)....90¢, dis 2 %
All other Primers, all sizes....$1.10, dis 2 %
Shell—
Paper Shot Shells, 1st & 2d or S. G. qual. dis 25&5&2 %
Seibold's Combination Shot Shells....dis 25&10&2 %
Paper Shot Shells, Club, Rival, Climax.dis 40&5&2 %
Paper Shot Shells, Star Brand....dis 50&5&2 %
Brass Shot Shells, 1st quality....dis 60&2 %
Brass Shot Shells, Club, Rival & Climax...dis 65&2 %
Wads—
U. M. C. & W. R. A.—B. E., 11 up....$2.00 } dis 20&2 %
U. M. C. & W. R. A.—B. E., 9&10....2.30
U. M. C. & W. R. A.—B. E., 7&8....2.60
U. M. C. & W. R. A.—P. E., 11 up....3.10
U. M. C. & W. R. A.—P. E., 9&10....4.00
U. M. C. & W. R. A.—P. E., 7&8....490
Eley's B. E., 11 up....$1.75
Eley's P. E., 11 @ 20....$2.80

Anvils.
Eagle Anvils....℘ ℔ 10¢—dis 20 @ 20&5 %
Wright's....9½¢
Armitage's Mouse Hole....9¢
Armitage Mouse Hole, Extra....11½¢
Trenton....9½¢
Wilkinson's....9½¢@10¢
J. & Riley Carr Patent Solid....11@11½¢
Anvil Vise and Drill—
Millers Falls Co., $18.00....dis 20 %
Cheney Anvil and Vise....dis 25 %
Allen Combined Anvil and Vise, $2.50....dis 40 %

Augers and Bits.
Douglass Mfg. Co. } ...dis 60&10 %
New Haven Copper Co.
Wm. A. Ives & Co.
Humphreysville Mfg. Co.
French, Swift & Co.
Connecticut Valley Mfg. Co
Snell's....dis 60@60&5 %
Cook's, Douglass Mfg. Co....dis 55 %
Cook's, New Haven Copper Co...dis 50&10@50&10&5 %
Ives' Circular Lip....dis 60 %
Patent Solid Head....dis 30 %
C. E. Jennings & Co., No. 10, extension lip....dis 40 %
C. E. Jennings & Co., No. 30....dis 60 %
C. E. Jennings & Co., Auger Bits, in fancy boxes, ℘ set, 32½ quarters, No. 5, $5; No. 30, $3....dis 20 %
Lewis' Patent Single Twist....dis 45 %
Russell Jennings' Augers and Bits....dis 25 %
Imitation Jennings Bits (new list).dis 50&10@50&10&5 %
Car Bits, Snell Mfg. Co....dis 40&10&10 %
Car Bits, New Haven Copper Co....dis 50&10 %
L'Hommedieu Car Bits....dis 15 @ 20 %
Snell Mfg. Co.'s Jennings' Bits (new list)....dis 50&5 %
Forstner Pat. Auger Bits....dis 10 %
Hollow Augers—
Ives } dis 25&10 @ 25&10&5 %
French, Swift & Co.
Douglass'
Expansive Bits—
Clark's small, $18; large, $26....dis 35 @ 35&5 %
Ives' No. 4, per doz., $60....dis 35 @ 40 %
Swan's....dis 40 %
Ansonia....dis 25 %
Steer's, No. 1, $26; No. 2, $22....dis 35 %
Bonney's Adjustable ℘ doz. $48....dis 40&10 %
Stearns' Adjustable ℘ doz. $48....dis 20&10 %
Ives' Expansive, each $4.50....dis 45 @ 50 %
Universal Expansive, each $4.50....dis 20 %
Wood's....dis 25 @ 25&10 %
Gimlet Bits—
Common....℘ gross $3.00 @ $3.2
Diamond....℘ doz. $1.10, dis 25&10 %
"Bee"....dis 25 %
Double Cut, Shepardson's....dis 45 5
Double Cut, Ct. Valley Mfg. Co....dis 30&10 %
Double Cut, Hartwell's, ℘ gro, $6.50....dis 10 %
Double Cut, Douglass'....dis 40 %
Double Cut, Ives'....dis 50&10@5 . . 10&5 %
Holt's Patent....dis 40&10 %
Syracuse....dis 30 @ 30&5 %
Bit Stock Drills—
Morse Twist Drills....dis 50 %
Standard....dis 50&10 %
Cleveland....dis 50&10 %
Syracuse....dis 50&10 %
Williams' or Holt's....dis 50&10&10 %
Ship Augers and Bits—
L'Hommedieu's....dis 15 @ 20 %
Watrous's....dis 15 @ 20 %
Snell's....dis 15 @ 20 %
Snell's Ship Auger Pattern Car Bits....dis 15 @ 20 %

Awl Hafts.
Sewing, Brass Ferrule....$3.50 ℘ gross—dis 40&10 %
Patent Sewing, Short....$1.00 ℘ doz—dis 40&10 %
Patent Sewing, Long....$1.20 ℘ doz.—net
Patent Peg, Plain Top....$10.00 ℘ gross—dis 45&10 %
Patent Peg, Leather Top....$12.00 ℘ gross—dis 45&10 %

Awls, Brad Sets, &c.
Awls, Sewing, Common....℘ gross $1.70—dis 35 %
Awls, Shouldered Peg....℘ gross $2.45—dis 40@40&10 %
Awls, Patent Peg....℘ gross 63¢—dis 40@40&10 %
Awls, Shouldered Brad....$2.70 ℘ gross—dis 35 %
Awls, Handled Brad....$7.50 ℘ gross—dis 45 %
Awls, Handled Scratch....$7.50 ℘ gross—dis 35&10 %
Awls, Socket Scratch....$1.50 ℘ doz—dis 25 @ 30 %

Awl and Tool Sets.
Aiken's Sets, Awls & Tools....℘ doz. $10.00—dis 50&10 %
Fray's Adj. Tool Handles, No. 1, $12; No. 2, $18 } dis 25 @ 25&10 %
Miller's Falls Adj. Tool Handles, No. 1, $12; No. 2, $18
Henry's Combination Haft....℘ doz. $6
Brad Sets, No. 42, $10.50, No. 43, $12.50...dis 70&10&5 %
Brad Sets, Stanley's Excelsior, No. 1, $7.50. } dis 30&10 %
Brad Sets, Stanley's Excelsior, No. 2, $4.00.
Brad Sets, Stanley's Excelsior, No. 3, $5.50.

Axes.
Makers' Brands—
First quality....℘ doz $6.50 @ $7.00
Others....℘ doz $6.00 @ $6.50
Special brands....℘ doz $5.50 @ $6.00

Axle Grease.
Fraser's, in bulk....Keg ℘ ℔, 4¢; Pail, ℘ ℔, 5¢ net
Frasers, ℔ boxes....℘ gross $9.50
Dixon's Everlasting, in bxs., ℘ doz., 1 ℔; $1.20; 2 ℔, $2
Dixon's Everlasting....10-℔ pails, each, 85¢
Lower grades, special brands....℘ gro $5.50 @ $7

Axles.
Nos. 1 to 6....3¾¢; Short bed, 4½¢
Nos. 7 to 18....dis 60&5 @ 60&10 %
Nos. 19 to 22....dis 70&5 %
Nos. 23 to 26....dis 60&5 %
National Wrought Steel Tubular Self-Oiling:
Standard Farm (1 to 5) and Special Farm (A1 to A5)
Less than 10 sets....dis 33⅓ %
Over 10 sets....dis 33⅓&5 %
X Strong Exp. (6 to 9), & XX Strong Truck (10 to 16):
Less than 10 sets....dis 10 %
Over 10 sets....dis 10&5 %

Bag Holders.
Sprengle's Pat., ℘ doz $18....dis 60 %

Balances.
Spring Balances....dis 50 %
Common 24 ℔....℘ doz., $1.50—dis 50 %
Chatillon's Spring Balances....dis 50 %
Chatillon's Circular Spring Balances....dis 60 %

Bells.
Hand—
Light Brass....dis 75&10 @ 75&10&5 %
Extra Heavy....dis 65&10 @ 70 %
White Metal....dis 70 @ 70&5 %
Silver Chime....dis 25&10&5 %
Globe (Cone's Patent)....dis 25&10 %
Door—
Gong, Abbe's....dis 25&10 @ 35 %
Gong, Yankee....dis 40&10 %
Gong, Barton's....dis 40&10 @ 50 %
Crank, Taylor's....dis 25&10 %
Crank, Brooks'....dis 50&10&2 %
Crank, Cone's....dis 10 %
Crank, Connel's....dis 20&10 %
Lever, Sargent's....dis 60&10 %
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned....dis 25&10 %
Lever, R. E. M. Co.'s....dis 50&10&2 %
Pull, Brook's....dis 50&10&2 %
Pull, Western....dis 25&10 %
Cow—
Common Wrought....dis 60&10 %
Western....dis 20&10 %
Western, Sargent's list....dis 70&10 %
Kentucky "Star"....dis 20&10 %
Kentucky, Sargent's list....dis 70&10 %
Dodge, Genuine Kentucky, new list....dis 70@70&5 %

Nos.	0	1	1½	2	3	4	5	6	7	Hog
	$12.00	10.00	9.00	8.00	6.00	5.00	4.00	3.00	2.50	5.00

Texas Star....dis 50&10 @ 50&10&5 %
Call....dis 40@40&5 %
Farm Bells....℘ ℔, 2¾ @ 3¢
Steel Alloy Church and School Bells....dis 40 %

Bellows.
Blacksmiths'....dis 50&10 @ 50&10&5 %
Molders'....dis 50@50&5 %
Hand Bellows....dis 50@50&5 %

Belting, Rubber.
Standard....dis 70&5 @ 70&10 % } dis 5 % cash.
Extra....dis 60@60&10 %
N. Y. B.& P. Co., Standard...dis 60&10 %
N.Y.B.&P.Co., Extra....dis 50&10 %
Cleveland Rubber Co., Extra..dis 60&10 %

Bench Stops.
Hotchkiss's....℘ doz $5.00—dis 10 @ 10&10 %
Weston's, per doz No. 1, $10: No. 2, $9...dis 25&10&5 %
McGill's....℘ doz $3—dis 10 %
Morrill's....℘ doz $9—dis 50 %

Bit Holders.
Extension, Barber's....℘ doz $15.00—dis 40&5 %
Extension, Ives'..℘ doz $20.00—dis 40&10 @ 40&10&5 %
Diagonal....℘ doz $24.00—dis 40 %
Angular....℘ doz $24.00—dis 40&5 %

Blind Adjusters.
Domestic....℘ per doz $3.00—dis 33⅓ %
Excelsior....℘ doz $10.00—dis 50&10&2 %
Washburn's Self-Locking....dis 20 @ 20&10 %

Blind Fasteners.
Mackrell's....℘ doz pairs, $1.00—dis 20@20&10 %
Van Sand's Screw Pattern....$15 ℘ gro.—dis 50&10 %
Van Sand's Old Pattern....$15 ℘ gro.—dis 50&10 %
Washburn's Old Pattern....$9 ℘ gro. net
Merriman's....new list, net
Salisbury & Austin No. 2008....$9 ℘ gro. net
Security Gravity....$9 ℘ gro. net

Blind Staples.
Barbed, ½ in. and larger....℘ ℔ 8 @ 8½¢ net
Barbed, ⅜ in....℘ ℔ 9 @ 9½¢ net

Blocks.
Tackle Blocks, &c, list April 17, 1885..dis 50 @ 50&10 %
Reed Mfg. Co. Self-Lubricating....dis 50 %

Bolts.
Door and Shutter—
Cast Iron Barrel, Square, &c....dis 70 @ 70&5 %
Cast Iron Shutter Bolts....dis 70 @ 70&5 %
Cast Iron Chain (Sargent's list)....dis 65&10 %
Ives' Patent Door Bolts....dis 55 %
Wrought Barrel....dis 70 @ 70&5 %
Wrought Square....dis 70 @ 70&5 %
Wr't Shutter, all Iron, Stanley's list....dis 60&10 %
Wr't Shutter, Brass Knob, Stanley's....dis 40&10 %
Wrought Shutter, Sargent's list....dis 60&10 %
Wrought Sunk Flush, Sargent's list....dis 55&10 %
Wrought Sunk Flush, Stanley's list....dis 40&10&5 %
Wrought B. K. Flush, Com'n Stanley's list.dis 55&10 %
Carriage—
Com. list June 10, '84....dis 80 @ 80&5 %
Genuine Eagle, list Oct., '84....dis 75 @ 75&5 %
Phila. pattern, list Oct. 7, '84...dis 75&10@75&10&5 %
R. B. & W., old list....dis 70&5 %
Tire—
Common, list Feb. 28, 1883....dis 65&10 %
P. C. B. & N. Co., Empire, list Feb. 28, 1883.dis 65&10 %
P.C.B.&N.Co., Keystone, Phil. list, Oct. '84...dis 82½ %
P.C.B.&N.Co., Norway, Phil. list, Oct. '84...dis 80 %
Am. S. Co., Norway, Phil., list Oct. 16, '84....dis 80 %
Am. S. Co., Eagle, Phil., list Oct. 16, '84....dis 82½ %
Am. S. Co., Philadel. list. Oct. 16, '84....dis 82½&5 %
Am. S. Co., Bay State, list Feb. 28, '83....dis 65&10 %
R. B. & W., Philadel. list Oct. 16, 1884....dis 80&5 %
R. & E. Mfg. Co....dis 65&10 %
Stove and Plow—
Stove....dis 70 %
Plow....dis 65 %
Am. S. Co. Stove, Annealed....dis 70 %
R. B. & W., Plow....dis 50&5 %
R. B. & W., Stove....dis 70&5 %
Machine....dis 80 @ 80&5 %
Bolt Ends....dis 80 @ 80&5 %

Borax....℘ ℔ 8¼¢ @ 8½¢

Boring Machines.

Without Augers.	Upright.	Angular.	
Douglas	$5.50	$6.75	dis 50 %
Snell's, Rice's Patent	5.50	6.75	dis 40&10&10 %
Jennings	5.50	6.75	dis 45@45&10 %
Other Machines	2.35	2.75	net
Phillips' Pat., with Augers	7.00	7.80	net

Bow Pins
Humason, Beckley & Co.'s, Nos. 1 and 2—dis 60&10 @ 60&10&5 %
Humason, Beckley & Co.'s other Nos..dis 70 @ 70&10 %
Sargent & Co.'s....$17 and $18, dis 60&10 %
Peck, Stow & W. Co....dis 50&10 @ 50&10&5 %

Braces.
Backus, Nos. 110 to 114 and 31 to 33..dis 60&5@60&10 %
Backus, Nos. 6, 8, 12, 14....dis 60&10&5 %
Backus, Nos. 16, 18, 20, 29, 7, 9, 11....dis 70&10&5 %
Barber's, Nos. 10 to 16....dis 50 %
Barber's, Nos. 30 to 35....dis 50 %
Barber's, Nos. 40 to 63....dis 50&10 %
Spofford's....dis 50&10 %
Ives' New Haven....dis 70 @ 70&5 %
Ives' Novelty....dis 6 &5 @ 60&10 %
Ives' Novelty, Improved....dis 60&5 @ 60&10 %
Ives' Spofford....dis 60 @ 60&5 %
Common Ball, American....8½ in., $1.30; 10 in. $1.50
Bartholomew's, Nos. 25, 27, 30..dis 50&10@50&10&10 %
Bartholomew's, Nos. 117, 118, 119....dis 65 @ 65&5 %
Amidon's Barker's Imp'd....dis 60&10&5 %
Amidon's Ratchet....dis 70 @ 70&5 %
Amidon's Corner Brace....dis 40 @ 40&10 %
Amidon's Universal....8 in., $1.90; 10 in., $2.10
Amidon's Buffalo Ball....8 in., $1.35 @ $1.40
P. S. & W....dis 50&10 %

Brackets.
Shelf, plain, Sargent's list....dis 55&10 @ 55&10&10 %
Shelf, fancy, Sargent's list....dis 60&10 @ 60&10&10 %
Reading, plain....dis 60&10 @ 60&10&10 %
Reading, Rosette....dis 65&10 @ 65&10&10 %

Bright Wire Goods.
Regular list....dis 75&10 %

Broilers.

Henis' Self-Basting..	Inch....	9	10	9 x 11
	Per doz....	$4.50	5.50	6.50

Buckets.—See Well Buckets and Pails.

Bull Rings.
Union Nut Co....dis 55 %
Sargent's....dis 66⅔&10 %
Hotchkiss' low list....dis 30 %
Humason, Beckley & Co.'s....dis 70&10 %
Peck, Stow & W. Co.'s....dis 50&10 %
Ellrich Hdw. Co., White Metal, low list....dis 50 %

Butts.
Brass—
Wrought Brass....dis 80 @ 80&10 %
Cast Brass, Tiebout's....dis 40 %
Cast Brass, Corbin's F. Joint....dis 33⅓&10@33⅓&10&10 %
Cast Brass, Loose Joint....dis 33⅓&10@33⅓&10&10 %
Cast Iron—
Fast Joint, Narrow....dis 60&5 @ 60&10&5 %
Fast Joint, Broad....dis 60&5 @ 60&10&5 %
Loose Joint. } dis 70&10@70&10&5 %
Loose Joint, Japanned.
Loose Joint, Jap. with Acorns.
Parliament Butts.
Mayer's Hinges.
Loose Pin, Acorns.
Loose Pin, Acorns, Japanned.
Loose Pin, Acorns, Jap, Pltd. Tips.
Wrought Iron—
Fast Joint, Narrow....dis 65&2 %
Fast Joint, Lt. Narrow....dis 65&2 %
Fast Joint, Broad....dis 65&2 %
Loose Joint, Broad....dis 65&5&2 %
Table Butts, Back Flaps, &c....dis 65&2 %
Inside Blind, Regular....dis 65&2 %
Inside Blind, Light....dis 65&2 %
Loose Pin, Wrt....dis 65&5&2 %
Loose Pin, Light....dis 65&2 %
Bronzed Wrought Butts....dis 40&2 %
Blind Butts—
Parker....dis 75&2 %
Palmer....dis 50&5&10 %
Seymour....dis 70&2 %
Lull & Porter....dis 80 %
Nicholson....dis 45&10 %
Buffer....dis 50 %
Clark's, Nos. 1, 3, 5....dis 80&5 @ 80&10 %
Sargent's, Nos. 1, 3, 5, 11, 13....dis 75&10 %
Sargent's, No. 12....dis 75&10&10 %
Reading's Gravity....dis 75&10 %
Shepard's "Noiseless" Nos. 50, 60, 65, 45 and 55....dis 75&10 @ 80 %
Shepard's Champion Gravity, No. 75...dis 80&5&5 %
Shepard's "Gravity," Nos. 1, 3 and 5....dis 80 %
Shepard's Steamboat Gravity, No 10.dis 80&10&2½ %
Shepard's "O. S." and "Acme" Lull & Porter....dis 75&10&5 %
Shepard's "Queen City" Reversible....dis 75&10 %
Clark's Improved Shutter Hinge, Nos. 0, 1, 1½, 2, 2½, 3....dis 70 @ 70&5 %
North's Automatic Blind Fixtures, No. 2, for Wood, $10.50; No. 3, for Brick, $13.50....dis 25&2 %

Butcher's Cleavers.
Humason & Beckley Mfg. Co....dis 30&5 @ 30&10 %
Bradley's....dis 25 @ 30 %
Beatty's....dis 33⅓&5 %

1	2	3	4	5	6	7	8
$16.50	19.00	21.50	24.00	27.00	30.00	33.50	36.50

New Haven Edge Tool Co.'s....dis 40 %
Albertson Mfg. Co....dis 33⅓ @ 33⅓&5 %

Calipers.—See Compasses.

Can Openers.
Messenger's Comet....℘ doz $3.00, dis 25 %
American....℘ gross $3.00
Duplex....℘ doz 25¢, dis 15 @ 20 %
Lyman's....℘ doz $3.75, dis 20 %
No. 4, French....℘ doz $2.25, dis 55 @ 60 %
No. 5, Iron handle....℘ gross $6.00, dis 45 @ 50 %
Eureka....℘ doz $2.50, dis 10 %
Sardine Scissors....℘ doz $7.00, dis 55 %
Star....℘ doz $5.00, dis 25&5 %
Sprague, No. 1, $2; 2, $2.25; 3, $2.50....dis 60@60&10 %
World's Best, ℘ gross, No. 1, $12.00; No. 2, $24.00; No. 3, $36.00....dis 50&10 %
Universal....℘ doz $3.00, dis 35&5 %
Domestic....℘ doz $2.50, dis 45 %
Champion....℘ doz $2.00, dis 50 %

Cards.
Horse and Curry....dis 10 @ 10&10 %
Cotton....New list, Aug., 1883, dis 10 %
Wool....".." "...dis 10 %

Carpet Stretchers.
Cast Steel, Polished....℘ doz $3.25
Cast Iron, Steel Points....℘ doz 80¢
Socket....℘ doz $1.75
Bullard's....dis 25 @ 25&10 %

Carpet Sweepers.
Bissell No. 5....℘ doz $17.00
Bissell No. 7 New Drop Pan....℘ doz $19.00
Bissell No. 12 Hall Sweeper....℘ doz $36.00
Grand Rapids....℘ doz $27.00
Crown Jewel....No. 1, $18; No. 2, $19; No. 3, $20
Magic....℘ doz $15.00
Jewel....℘ doz $17.00
Mystic....℘ doz $17.00
Cottage....℘ doz $15.00
Garland....℘ doz $19.00
Queen....℘ doz $16.00
Queen, with band....℘ doz $18.00
King....℘ doz $30.00
Weed Improved....℘ doz $18.00
Hub....℘ doz $16.00
Cog Wheel....℘ doz $16.00
Church....each $3.00

Cartridges.—See Ammunition.

Casters.
Bed } dis 60 @ 60&5 %
Plate
Shallow Socket
Deep Socket....dis 45 @ 50 %
Yale Casters, list May, 1884....dis 25&10@25&10&5 %
Yale, Gem....dis 60@60&5 %
Martin's Patent (Phoenix)....dis 45&10 @ 50 %
Payson's Anti friction....dis 60 %
"Giant" Truck Casters....dis 10 @ 10&5 %
Stationary Truck Casters....dis 45&10

Cattle Leaders.
Humason, Beckley & Co.'s....dis 75 %
Sargent's....dis 66⅔&10 %
Hotchkiss....dis 30 %
Peck, Stow & W. Co....dis 50&10 %

Chain.
Trace, 6½-10-2, Eng. sizes....℘ pair 79¢ } dis 50&10 @ 60 %
Trace, 6½-10-3, Eng. sizes....℘ pair 70¢
Trace, 7-10-2, Eng. sizes....℘ pair 86¢
Log, Fifth, Stretcher, and other fancy Chains, list Nov. 1 1884....dis 50&10 @ 60 %

American Coil	3-16	¼	5-16	⅜	7-16	½	⅝	¾	1 to 1¼
In cask lots	$8.75	5.50	4.30	3.75	3.65	3.50	3.40	3.35	3.30

American Coil, less than cask lots, add ¼¢ ℘ ℔.
German Coil, list of June, 1881....dis 55&5@60 %
German Halter Chain, list of June, 1884.dis 55&5@60 %
Covert Halter, Hitching and Breast....dis 50&2 %
Covert Traces....dis 40&2 %
Oneida Halter Chain (old list)....dis 45 %
Galvanized Pump Chain....℘ ℔ 5½¢ @ 6¢
Jack Chain, Iron....dis 75&10 @ 75&10&5 %
Jack Chain, Brass....dis 75 @ 75&10 %

Chalk.
White....℘ gro 55¢
Red....℘ gro 75¢
Blue....℘ gro 90¢
White Crayons....℘ gro 12¢ @ 12½¢

Chalk Lines.—See Lines.

Cherry Seeders....℘ doz $3

Chisels.
Socket Framing and Firmer—
Witherby and Douglas } dis 75 @ 75&5 %
P., S. & W.
New Haven and Middlesex
Buck Bros....dis 30 %
Merrill....dis 60&10&10 %
L. & I. J. White....dis 30 %
Tanged Firmers....dis 50 @ 50&5 %
Tanged Firmers, Butcher's....$4.75 @ $5.00
Tanged Firmers, Spear & Jackson's....$5.00 to £
Tanged Firmers, Buck Bros....dis 30 %

Chucks.
Morse's Beach Patent....each, $8.00, dis 20 %
Morse's Adjustable....each, $7.00, dis 20 @ 20&5 %
Danbury....each, $6.00, dis 30 @ 30&5 %
Syracuse, Balz Pat....dis 25 %

Clamps.
Providence Tool Co.'s Wrought Iron....dis 25 %
Adjustable, Gray's....dis 20 %
Adjustable, Lambert's....dis 20 %
Adjustable, Snow's....dis 40&5 %
Adjustable, Hammer's....dis 15 %
Adjustable, Stearns'....dis 20&10 %
Cabinet, Sargent's....dis 66⅔&10 %
Carriage Makers', Sargent's....dis 66⅔&10 %
Eberhard Mfg. Co....dis 40&5 @ 40&10 %
Warner's....dis 40&10 %
Saw Clamps....See Vises

Clips.
Axle and Spring Bar, Norway Iron....dis 65&2 %
Common Axle Clips....dis 70 %
Wrought-Iron Felloe Clips....℘ ℔ 5½¢
Steel Felloe Clips....℘ ℔ 5¢

Cockeyes....dis 50 %

Cocks, Brass.
Hardware list....dis 55&10&2 %

Coffee Mills.
Board and Box....dis 45&10&2 %
Selsor's Patent....$9.50, $10.50, dis 25 %
American, Enterprise Mfg. Co....dis 20&10@30 %
The "Swift," Lane Bros....dis 20&10 %
Webb's Patent....dis 45 %

Compasses, Dividers, &c.
Compasses, Calipers, Dividers....dis 70@70&10 %
Bemis & Call Co.'s Dividers....dis 60&5 %
Bemis & Call Co.'s Compasses & Calipers....dis 50&5 %
Bemis & Call Co.'s Wing & Inside or Outside.dis 50&5 %
Bemis & Call Co.'s Double....dis 60 %
Bemis & Call Co.'s (Call's Patent Inside)....dis 30 %
Excelsior....dis 50 %
Cook's Extension....dis 20 @ 20&5 %
J. Stevens & Co.'s Calipers and Dividers....dis 25&10 %

Coopers' Tools.
Bradley's....dis 20 %
Barton's....dis 20@20&5 %
L. & I. J. White....dis 20&5 %
Albertson Mfg. Co....dis 25 %
Beatty's....dis 33⅓ @ 40 %
Sandusky Tool Co....dis 30 @ 30&5 %

Corkscrews.
Humason & Beckley Mfg. Co....dis 40 @ 40&5 %
Clough's Patent....dis 33⅓ @ 33⅓&5 %
Howe Bros. & Hulbert....dis 35 %

Corn Knives and Cutters.
Bradley's....dis 10 %
Wadsworth's....dis 25 %

Cradles.
Grain....dis 40&5&2 %

Crow Bars.
Cast Steel....℘ ℔ 3¾¢
Iron, Steel Points....℘ ℔ 3¼ @ 3½¢

Curry Combs.
Fitch's....dis 50&10 @ 50&10&10 %
Rubber....℘ doz $10.00, dis 25 @ 30 %
Perfect....dis 50 %

Curtain Pins.
Silvered Glass....net
White Enamel....net

Cutlery.
Beaver Falls and Booth's....dis 33⅓ %
Wostenholme....$7.75 @ $8.00 to £

Dividers.—See Compasses.

Dog Collars.
Embossed Gilt, Pope & Stevens' list....dis 30&10 %
Leather, Pope & Stevens' list....dis 40 %
Brass, Pope & Stevens' list....dis 40 %

Door Springs.
Torrey's Rod, regular size....℘ doz $1.30
Gray's....℘ gro, $20.00, dis 20 %
Bee Rod....℘ gro, $20.00, dis 20 %
Warner's No. 1, ℘ doz. $2.50; No. 2, $3.30.dis 40&10@50 %
Gem (Coil), list April 19, 1886....dis 10 %
Star (Coil), list April 19, 1886....dis 20 %
Victor (Coil)....dis 60 @ 60&10 %
Champion (Coil)....dis 60&10 @ 60&10&10 %
Philadelphia....5 in., $5.00; 8 in., $7.75, dis 30 %
Cowell's....No. 1, ℘ doz $13.00; No. 2, $15.00, dis 50 %
Rubber, complete....℘ doz $4.50, dis 55&10 %
Hercules....dis 50 %
Shaw Door Check and Spring....dis 25 @ 30 @ 35 %
Elliott's Door Check and Spring....dis 25 %

Drawing Knives.
Witherby and Douglas } dis 75 @ 75&5 %
P., S. & W.
New Haven and Middlesex
Merrill....dis 60&10&10 %
Watrous....dis 15&10 @ 25 %
L. & I. J. White....dis 20&5 %
Bradley's....dis 35 %
Adjustable Handle....dis 20 @ 25 %
Wilkinson's Folding....dis 25 @ 25&5 %

Drills and Drill Stocks.
Blacksmiths'....each, $1.50 @ $1.60
Blacksmiths' Self-Feeding....each, $7.50, dis 20 %
Breast, P. S. & W....dis 40&10 %
Breast, Wilson's....dis 30&5 %
Breast, Millers Falls....each, $3.00 dis 25 %
Breast, Bartholomew's....each, $2.50, dis 25&10 @ 40 %
Ratchet, Merrill's....dis 20 %
Ratchet, Ingersoll's....dis 25 %
Ratchet, Parker's....dis 20 @ 20&5 %
Ratchet, Whitney's....dis 20&10 %
Ratchet, Weston's....dis 20@25 %
Ratchet, Moore's Triple Action....dis 25 @ 30 %
Whitney's Hand Drill, Plain, $11.00; Adjustable, $12.00....dis 20&10 %
Wilson's Drill Stocks....dis 10 %
Automatic Boring Tools....each, $1.75 @ $1.85
Twist Drills—
Morse....dis 50 %
Standard....dis 50&10 %
Syracuse....dis 50&10 %
Cleveland....dis 50&10 %
Williams....dis 50&10&10 %

Drill Bits.—See Augers and Bits.
Drill Chucks.—See Chucks.

Dripping Pans.
Per ℔....5¢ @ 5¼¢

Egg Beaters.
Dover....℘ doz., $2.50
National....℘ doz $4.50, dis 33⅓ %
Family (T. & S. Mfg. Co.)....℘ gro, $17.00@$18.00
Standard....℘ gro, $12.00
Kingston....℘ gro, $9.00
Acme....℘ gro, $8.00
Triumph (T. & S. Mfg. Co.)....℘ gro, $10.50@$11.50
Advance No. 1....℘ gro $10.50
Advance, No. 2....℘ gro $10.00
Bryant's....℘ doz $2.00
Ayres' Spiral....℘ gro $5

Electric Bell Sets.—Wollensak's....dis 20 %

Emery.	No. 4 to 60 gr.	No. 54 to 150 gr.	Flour, CF, F, FF.
Kegs, ℘ ℔	4 ¢	4 ¢	2½¢
½ kegs, ℘ ℔	4¼¢	4¼¢	2¾¢
¼ kegs, ℘ ℔	4¾¢	5 ¢	3¼¢
10-℔ cans, ℘ ℔	7 ¢	7 ¢	5 ¢

Enameled and Tinned Ware.—See Hollow-Ware.

Escutcheon Pins.
Iron and Brass, list Nov. 11, 1885....dis 50&10 %

Escutcheons.
Door Lock....Same discounts as Door Locks
Brass Thread....dis 60 @ 60&10 %
Wood....dis 25 %

Faucets.
Fenn's....dis 40 %
Bohren's Patent Rubber Ball....dis 25 %
Fenn's Cork Stops....dis 33⅓ %
Star....dis 60 @ 60&5 %
Frary's Patent Petroleum....dis 40&10&2 %
West's Patent Key....dis 50 %
Anchor Lock....dis 45 %
Metallic Key, Leather Lined....dis 55&10 @ 60&10 %
Cork Lined....dis 70 @ 70&10 %
J. Sommer's Best Block Tin Key....dis 40 %
J. Sommer's Cork Lined, 1st quality....dis 50 %
J. Sommer's Diamond Lock....dis 40 %
Self-Measuring, Enterprise...℘ doz $36.00—dis 20&10 %
Self-Measuring, Lane's....℘ doz $36.00—dis 25&10 %
Self-Measuring, Victor....℘ doz $36.00—dis 25&10 %

Felloe Plates....℘ ℔ 6 @ 6¼¢

Files.
Domestic—
Best brands, list Dec. 1, 1885...dis 60&10@60&10&5 %
Lower Grade, list Dec. 1, 1885....dis 70@70&5 %
J. B. Smith Co. Screw Tang...dis 55&10@55&10&10 %
New Am. File Co., Pat. Tapers....dis 50 %
Heller's Horse Rasps....dis 50&10 %
Imported—
J. & Riley Carr....List, April 1, 1883, dis 15 %
J. & Riley Carr Horse Rasps....dis 10 %
Moss & Gamble....List April 1, 1883, dis 15 %
Butcher....Butcher's list, dis 20 %
Stubs....Stubs list, dis 25 @ 30 %

Fluting Machines.
Knox, 4½-inch Rolls....$3.25 each } dis 35 %
Knox, 6-inch Rolls....$3.60 each
Eagle, 3½-inch Roll....$2.15, dis 35 %
Eagle, 5½-inch Roll....2.85, dis 35 %
Crown, 4½ in., $3.50; 6-in, $4.00; 8-in., $6.50 each, dis 35 %
Crown Jewel....6-in., $3.50 each, dis 35 %
American, 5-in., $3; 6-in., $3.40; 7-in., $4.50 each, dis 35 %
Domestic Fluter....$1.50 each, net
Geneva Hand Fluter, White Metal...℘ doz $12, dis 25 %
Crown Hand Fluter, Nos. 1, $15; 2, $12.50; 3, $10.dis 30 %
Shepard Hand Fluter, No. 85....℘ doz $15.30, dis 40 %
Shepard Hand Fluter, No. 110....℘ doz $11, dis 40 %
Shepard Hand Fluter, No. 95....℘ doz $8, dis 40 %
Clark's Hand Fluter....℘ doz $15.00, dis 33⅓ %
Combined Fluter and Sad Iron...℘ doz $15.00, dis 30 %
Buffalo....℘ doz $10.00 dis 10 %

Fluting Scissors....dis 45 %

Fly Traps.—Paragon....℘ doz $2
Balloon....℘ doz $1.75

Forks.
Hay, Manure, &c., Asso. list....dis 60&10&10 %
Hay, Manure, &c., Phila. list....dis 60 @ 60&5 %
Plated, see Spoons.

Freezers, Ice-Cream.
Leading Goods....dis 60&2 @ 60&5 %

Fruit and Jelly Presses.
Enterprise Mfg. Co....dis 20&10 @ 33⅓ %
Henis....℘ gross $45, ℘ doz $4 @ $4.50

Fry Pans.
Central Stamping Co.'s list....dis 33⅓&2 @ —%

No.	0	1	2	3	4	5	6	7	8
℘ doz.	$1.50	1.75	2.00	2.25	2.50	2.75	3.25	3.75	4.25

Sidney Shepard & Co....dis 40&2 %
Acme....dis 60 %
Iron Clad Mfg. Co.'s list....dis 70 %

No.	0	1	2	3	4	5	6	7	8
℘ doz.	$3.00	3.75	4.25	4.75	5.25	6.00	7.00	8.00	9.00

Gauges.
Marking....dis 60&10 %
Wire, low list....dis 10&10 %
Wire, Wheeler, Madden & Co....dis 10 %
Wire, Morse's....dis 50 @ 50&5 %
Wire, Brown & Sharpe's....dis 10 %

Gimlets.
Nail and Spike....dis 50&10&5 %
"Eureka" Gimlets....dis 40&10 %
"Diamond" Gimlets....dis 40&10 %
Double Cut, Shepardson's....dis 45 %
Double Cut, Ives'....dis 50 %
Double Cut, Douglass'....dis 40 %
"Bee"....℘ gross $12, dis 25 %

Glue Pots.
Tinned and Enameled....dis 35@35&5 %
Family, Howe's "Eureka"....dis 40 %
Family, L. F. & C.'s "Handy"....dis 45 %

Grindstone Fixtures.
Sargent's Patent....dis 70&10 %
Reading Hardware Co....dis 33⅓&10 %

Hack Saws.—See Saws.

Halters.—Covert's Pat. ½ Jute....dis 50&10&2 %
Covert's Hemp Horse and Cattle Tie....dis 50&10&2 %
Covert's Jute Horse and Cattle Ties....dis 60&2 %
Meneely's Pat. Adjustable Hemp and Jute..dis 50&10 %
Meneely's Hemp and Jute Horse and Cattle Ties....dis 50&10 %

Hammers.
Maydole's....List Dec. 1, 1885, dis 25 @ 25&10 %
Cheney's, new list, March, 1883....dis 20&10 %
Hartford Hammer Co.'s Nail Ham's....dis 25&10@35 %
Buffalo Hammer Co....dis 30 @ 35 %
C. Hammond & Son....dis 40&10 @ 50 %
Humason & Beckley....dis 25 %
Verree....dis 5 %
Magnetic Tack, Nos. 1,2,3, $1.25, 1.50 and 1.75.dis 25&10 %
Nelson Tool Works....dis 40&10 %
Warner & Nobles....dis 10 %
Yerkes & Plumb, A. E. Nail....dis 40&10@40&10&5 %
Peck, Stow & Wilcox....dis 40 %
Sargent's....dis 33⅓&10 %
Wilkinson's Smiths'....10¼¢ @ 11¢ ℘ ℔
Heavy Hammers and Sledges....dis 60&10 %

Hand Cuffs and Leg Irons.
Providence Tool Co., Hand Cuffs, $15.00 ℘ doz..dis 10 %
Providence Tool Co., Leg Irons, $25.00 ℘ doz....dis 10 %
Tower's....dis 25 %
Daley's Improved Hand Cuffs: 2 Hands, Polished, ℘ doz, $48; Nickeled, $57; 3 Hands, Polished, ℘ doz, $72; Nickeled, $84....dis 20 %

Handles.
Iron, Wrought or Cast.—
Door or Thumb.

Nos....	0	1	2	3	4	
Per doz..	$0.90	1.00	1.18	1.35	1.50	dis 60&10&10 %

Roggin's Latches....℘ doz. 30¢ @ 35¢
Bronze Iron Drop Latches....℘ doz. 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88....net
Barn Door....℘ doz. $1.40, dis 10&10 %
Chest and Lifting....dis 70 %
Handles, Wood—
Saw and Plane....dis 40&10 %
Hammer, Hatchet, Axe, Sledge, &c....dis 25 @ 30 %
Brad Awl....℘ gross $2.00
Hickory Firmer Chisel, assorted....℘ gross 4.50 } dis 40
Hickory Firmer Chisel, large....℘ gross 5.00
Apple Firmer Chisel, assorted....℘ gross 5.00
Apple Firmer Chisel, large....℘ gross 6.00
Socket Firmer Chisel, assorted....℘ gross 3.00
Socket Framing Chisel, assorted....℘ gross 5.00
J. B. Smith Co.'s Pat. File....dis 50 %
File, assorted....℘ gross 2.75 } dis 40 @ 40&10 %
Auger, assorted....℘ gross 5.00
Auger, large....℘ gross 7.00
Patent Auger, Ives'....dis 25 %
Patent Auger, Douglass'....℘ set $1.25 net
Patent Auger, Swan's....℘ set $1.00 net
Hoe, Rake, Shovel, &c....dis 50&10 %
Cross Cut Saw Handles—
Atkins' No. 1 Loop, ℘ pair, 30¢; No. 3, 22¢; No. 2 and No. 4 Reversible, 22¢.
Boynton's Loop Saw Handles....50¢, dis 60 %
Champion....15¢

Hangers.
Barn Door, old patterns....dis 60&10&10 @ 70 %
Barn Door, New England....dis 60&10&10 @ 70 %
Samson Steel Anti-Friction....dis 55 %
Orleans Steel....dis 55 %
Hamilton Wrought Wood Track....dis 55 %
U. S. Wood Track....dis 65 %
Champion....dis 60&10 %
Rider and Wooster, Medina Mfg. Co.'s list....dis 70 %
Climax Anti-Friction....dis 55 %
Climax Steel Anti-Friction....dis 50 %
Zenith for Wood Track....dis 55 %
Reed's Steel Arm....dis 40 %
Challenge....dis 50 %
Sterling Improved (Anti-Friction)....dis 65&10 %
Victor, No. 1, $15; No. 2, $16.50; No. 3, $18...dis 50&2 %
Cheritree....dis 50&5 %
Kidder's....dis 50&10 @ 50&15 %
The "Boss"....dis 60 %
Best Anti-Friction....dis 60 %
Duplex (Wood Track)....dis 60 %
Terry's Patent....℘ doz. pr., 3½ in. $10; 5 in., $12....dis 40&5@40&10
Cronk's Patent....No. 4, $12; No. 5, $14.40; No. 6, $18 ....dis 50&5 @ 50&10 %
Wood Track, Iron Clad....℘ ft. 8¢, dis 50&5 @ 50&10 %
Architect....℘ set $6.60, dis 20 %
Eclipse....dis 20&10
Feltx....℘ set $4.50, dis 20 %
Richards'..(lots of 50 sets dis 20&10&10 %)..dis 20&10 %
Lane's Steel Anti-Friction....dis 30&10 %
The Ball Bearing Door Hanger....dis 20&10 @ 25&10 %
Warner's Patent....dis 20@20&10 %
Stearns' Anti-Friction....dis 20 @ 20&10 %
Faultless....dis 40 @ 40&5 %
American....℘ set $6; dis 20&10 %
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢....dis 40 %
Paragon, Nos. 1, 2 and 3....dis 50 %
Paragon, Nos. 4, 5, 5½ and 6....dis 25&5 %

Harness Snaps.
Anchor (T. & S. Mfg Co.)....dis 65 %
Henshaw's, list of 1½ changed to $14.00....dis 65 %
Judd's, list of 1½ changed to $14.00....dis 65 %
Fitch's (Bristol), list of 1½ changed to $14.00...dis 65 %
Hotchkiss....dis 10 %
Andrews....dis 50 %
Sargent's Patent Guarded....dis 70&10&10 %
German, old list....dis 75 %
German, Sargent's 1884 list....dis 50&10 %
Covert....dis 50&2 %
Covert, New Patent....dis 50&2 %
Covert New R. E....dis 60@2 %
Covered Spring....dis 66⅔&10 %

Hatchets.—List Jan. 1, 1886.
Isaiah Blood....dis 35 @ 40 %
Hunt's Shingling Lath and Claw....dis 40&5 %
Hunt's Broad....dis 40 %
Hurd's....dis 40&5 @ 40&10&5 %
Yerkes & Plumb....dis 40&10@40&10&5 %
Underhill Edge Tool Co....dis 40&5 @ 40&10
C. Hammond & Son....dis 40&10 @ 50 %
Simmons....dis 35 @ 40 %
Peck's....dis 40&10 @ 40&10&5 %
Kelly's....dis 50@50&5 %
Ten Eyck Edge Tool Co....dis 40&10@40&10&5 %
Collins, following list....dis 10

	Nos.	1	2	3
Shingling,	Nos. 1 2 3....℘ doz	$5.50	$6.00	$6.50
Claw,	Nos. 1 2 3....℘ doz	6.00	6.50	7.00
Lathing,	Nos. 1 2 3....℘ doz	5.50	6.00	6.50

Hay Knives.
Lightning....℘ doz $18 dis 20 %
Electric....℘ doz $9.50 @ $10.50
Gem....℘ doz $12.50 @ $13.50
Wadsworth's....dis 35&5 @ 40 %
Heath Patent....℘ doz $13 @ $13.50
Carter's Needle....℘ doz $18, dis 10&5 @ 10&10 %

Hinges.
Wrought Iron Hinges—
Strap and T....dis 65&5&2 %
Screw Hook and Strap { 8, 10, 12 in..℘ ℔....3¼@3¾¢
{ 14 to 36 in. ℘ ℔....2½@2¾¢
Heavy Welded Hook { 8 to 12 in., ℘ ℔....3¼@3¾¢
{ 14 in. & up, ℘ ℔....2½@2¾¢
Screw Hook and Eye { ½ in....℘ doz $1.50 } dis 10 %
{ ⅝ in....℘ doz $2.45
{ ¾ in....℘ doz $3.80
Rolled Blind Hinges, Nos. 32 and 34....dis 50&10 %
Rolled Blind Hinges, Nos. 232 and 234....dis 55&10 %
Rolled Plate....dis 70&10 %
Rolled Raised....dis 70&10 %
Plate Hinges { 8, 10 & 12 in., ℘ ℔....4¼¢
"Providence" { over 12 in., ℘ ℔....3¼¢
Spring Hinges—
Geer's Spring and Blank Butts....dis 40 %
Union Spring Hinge Co.'s list, March, 1886...dis 20 %
Acme, Crown, Empire and U. S....dis 30 %
American, Gem, and Star, Japanned....dis 20 %
American, Gem, and Star, Bronzed....net
Oxford, Bronze and Brass....net
Barker's Double Acting....dis 20&10 %
Union Mfg. Co....dis 25 %
Bommer's....dis 30 %
Buckman's....dis 25 %
Chicago....dis 30 %
Gate Hinges—
Western....℘ doz $4.40, dis 55 %
N. E....℘ doz $7.00, dis 55 %
N. E. Reversible....℘ doz $5.20, dis 55 %
Clark's, Nos. 1 2 3....dis 60&10&2 %
N. Y. State....℘ doz $5.00, dis 55 %
Automatic....℘ doz $12.50, dis 50 %
Common Sense....℘ doz pair $4.50, dis 50 %
Seymour's....dis 45&10 %
Shepard's, Nos. 1, 2, 10 and 20....dis 60&10&10 %
Shepard's, No. 3....dis 60&10&5 %
Reed's Latch and Hinges....℘ doz sets $12, dis 50 %

Hoes.
Handled—
Garden, Mortar, &c....dis 60&10&10 %
Planter's, Cotton, &c....dis 60&10&10 %
Warren Hoe....dis 60 %
Magic....℘ doz $4.75
Eye—
D. & H. Scovil....dis 15 %
Lane & Gale, S. & O. Pat....dis 50 @ 50&10 %
Maynard, " " ....dis 60 @ 60&5 %
Sandusky Tool Co., " " ....dis 60&10 %
Hubbard & Co., " " ....dis 60&10 %
Grub....dis 60 @ 60&10 %

Hog Rings and Ringers.
Hill's Improved Ringers....℘ doz, $5.50 @ 5.75
Hill's Old Style Ringers....℘ doz, $3.25 @ 3.50
Hill's Tongs....℘ doz, $5.50 @ 6.00
Hill's Rings....℘ doz boxes, $2.00 @ 2.25
Perfect Rings....℘ doz boxes $1.75 @ 2.00
Perfect Ringers....℘ doz $2.50
Blair's Hog Ringers....℘ doz, $2.50 @ 2.75
Blair's Hog Rings....℘ doz, $1.10 @ 1.15
Champion Ringers....℘ doz $2.25
Champion Rings, Double....℘ doz $2.25
Brown's Ringers....℘ doz, $2.25
Brown's Rings....℘ doz, $1.25 @ 1.35

Hoisting Apparatus.
"Moore's" Hand Hoist, with Lock Brake....dis 15 %
"Moore's" Differential Pulley Block....dis 20 %

Holders, Tool.
Balz Pat....℘ doz $4; dis 25 %

Hollow-Ware.
Iron—
Stove Hollow-Ware, Ground....dis 50&5@50&10 %
Stove Hollow-Ware, Unground....dis 50&10@60&5 %
Enameled and Tinned Hollow-Ware—
Kettles....dis 50&10 %
Oval Boilers, Saucepans and Glue Pots dis 30 @ 35 %
Gray Enameled Ware....dis 40 @ 40&5 %
Agate and Granite Ware....dis 25 %
Rustless Hollow-Ware....dis 50 @ 50&5 %
Galvanized Tea-Kettles—

Inch	6	7	8	9
Each	55¢	60¢	65¢	75¢

Silver Plated—
Reed & Barton....dis 40 %
Meriden Brittania Co....dis 40 %
Simpson, Hall, Miller & Co....dis 40 %
Rogers & Brother....dis 40 %
Holmes & Edwards Silver Co....dis 50 %
William Rogers Mfg. Co....dis 50 %

Hooks.
Cast Iron—
Bird Cage, Sargent's list....dis 60&10&10 %
Bird Cage, Reading....dis 60&10&10 %
Clothes Line, Sargent's list....dis 66⅔&10 %
Clothes Line, Reading list....dis 66⅔&10 %
Ceiling, Sargent's list....dis 60&10 %
Harness, Reading list....dis 60&10&10 %
Coat and Hat, Sargent's list....dis 60&10 %
Coat and Hat, Reading....dis 60&10 %
Wrought Iron—
Cotton....℘ doz $1.25
Cotton Pat. (N. Y. Mallet & Handle W'ks)....dis 30 %
Tassel and Picture (T. & S. Mfg. Co.)....dis 50 %
Wrought Staples, Hooks, &c....See Wrought Goods
Bench Hooks....See Bench Stops
Wire—
Wire Coat and Hat, Gem, list April, 1886....dis 45 %
Wire Coat and Hat, Miles', list April, 1886....dis 45 %
Belt....dis 80 @ 80&5 %
Wire Screw Hooks and Eyes..See Bright Wire Goods
Grass....℘ doz $2.00
Bush....dis 55 @ 60 %
Whiffletree—Patent....dis 55 %
Hooks and Eyes—Malleable Iron....dis 70 %
Hooks and Eyes—Brass....dis 60&10&10 %
Fish Hooks, American....dis 40&10 %

Horse Nails.

	Nos.	5	6	7	8	9	10	
Ausable	℘ ℔	31¢	28¢	26¢	25¢	24¢	23¢	dis 25&10 %
Clinton, Pl'n.	℘ ℔		23¢	21¢	20¢	19¢	18¢	dis 25&10 %
Clinton, Fin.	℘ ℔		24¢	22¢	21¢	20¢	19¢	dis 25&10 %
Essex	℘ ℔	31¢	28¢	26¢	25¢	24¢	23¢	dis 40 %
Putnam	℘ ℔	27¢	24¢	23¢	21¢	20¢	19¢	dis 5&7 %
Vulcan	℘ ℔	26¢	23¢	21¢	20¢	19¢	18¢	dis 12½ %
Northwest'n.	℘ ℔	28¢	25¢	23¢	22¢	21¢	20¢	dis 10&10 %
Globe	℘ ℔	26¢	23¢	21¢	20¢	19¢	18¢	dis 10&5&5 %
A. C.	℘ ℔	28¢	25¢	23¢	22¢	21¢	20¢	dis 25&5 %
C. B.-K.	℘ ℔	28¢	25¢	23¢	22¢	21¢	20¢	dis 25 %
Champlain	℘ ℔	31¢	28¢	26¢	25¢	24¢	23¢	dis 25&10 %
New Haven	℘ ℔	31¢	28¢	26¢	25¢	24¢	23¢	dis 25&10 %
Bridgewater	℘ ℔	28¢	25¢	23¢	22¢	21¢	20¢	dis 30 %
Saranac	℘ ℔	26¢	23¢	21¢	20¢	19¢	18¢	dis 25 @ 30 %
Champion	℘ ℔	28¢	25¢	23¢	22¢	21¢	20¢	dis 10&10&5 %
Capewell	℘ ℔	31¢	28¢	26¢	25¢	24¢	23¢	dis 35&5 %
Star	℘ ℔	26¢	23¢	21¢	20¢	19¢	18¢	dis 10&10 %

NOTE.—Concessions on above quotations are frequently made.

Horse Shoes.—See Shoes, Horse.

Hose, Rubber....75&10 @ 75&10&5 %
N. Y. B. & P. Co., Standard....dis 60 @ 60&10 %

Ice Picks, Chisels, &c.
American Ice Chisel Pol'd....℘ doz $3.00, dis 20 %
National Ice Chisel....℘ doz $6.25, dis 20 %
Novelty Ice Breakers....℘ doz $6.25, dis 20 %
White's Sliding Head Picks....℘ doz $2.50 dis 40 %
Dunlap's Ring Picks....℘ doz $2.00, dis 15 %
Wood Head Picks, Sargent's....℘ doz $1.60, dis 50&10 %
Iron Head Picks, Sargent's....℘ doz $1.25, dis 50&10 %
Ice Mallets, Pick in handle....℘ doz $2.00, dis 15 %
Ice Axes, Small Cast or Mall....℘ doz $1.25, dis 20&10 %
Combination Ice Tools....℘ doz $2.00 net
Acme Ice Pick and Tongs....℘ gross $55.00, dis 50&10 %
Roger's L'ghtning Ice Chisel....℘ gross $28.50

Ice Cream Freezers.—See Freezers.

Ice Tongs.
Champion, S. S. & Co....℘ doz $4.00, dis 25&10 %
Family....℘ doz $2.75, dis 20@25 %

Jack Screws.—See Screws.

Kettles.
Brass, 7 to 17 in. inclusive....℘ ℔ 22¢ net
Brass larger than 17 inches....℘ ℔ 24¢ net
Enameled and Tea Kettles....See Hollow-Ware

Keys.
Lock Association list Dec. 18, 1885....dis 45&2 %
Eagle, Cabinet, Trunk and Padlock....dis 40&2 %
Hotchkiss' Brass Blanks....dis 40 %
Hotchkiss' Copper and Tinned....dis 40 %
Hotchkiss' Padlock and Cabinet....dis 25 %
Ratchet Bed Keys....℘ doz $4.00, dis 15 %

Knife Sharpeners.
Parkin's Applewood Handles....℘ doz $6.00, dis 40 %
Parkin's Rosewood or Cocobolo...℘ doz $9.00, dis 40 %

Knives.
Wilson's Butcher Knives....dis 25 @ 30 %
Ames' Butcher Knives....dis 25 %
Nichols' Butcher Knives....dis 40&10 %
Ames' Shoe Knives....dis 20@25 %
Ames' Bread Knives....℘ doz $1.50, dis 15 @ 20 %
Moran's Shoe and Bread Knives....dis 20 %
Goodell Co., Butcher, Shoe, Bread, &c....dis 40 %
Hay and Straw....See Hay Knives
Table and Pocket....See Cutlery

Knobs.
Door Mineral } List Dec. 18, 1885, dis 45&2 %, but net prices are often made.
Door Por. Jap'd
Door Por. Por
Door Por. Plated
Hemacite Door Knobs, new list....dis 35&5@35&10 %
Yale & Towne Wood Knobs, list Dec. 1885....dis 40 %
Furniture Plain....75¢ gross incn. dis 10 %
Furniture, Wood Screws....dis 25&10 %
Base, Rubber Tip....dis 70&10&5 %
Picture, Judd's....dis 60&10&10 %
Picture, Sargent's....dis 66⅔&10 %
Picture, Hemacite....dis 35&5 %
Shutter, Porcelain....dis 65&10 %
Carriage, Japanned....℘ gross 30¢, dis 60&10 %

Ladles.
Melting, Sargent's....dis 55&10 %
Melting, Reading....dis 35&10 %
Melting, Monroe's Patent....℘ doz. $4.00, dis 40 %
Melting, P. S. & W....dis 35&10 @ 40
Melting, Warner's....dis 30 %

Lanterns.
Tubular, Standard No. 0, ℘ doz....$6.75 @ $7.00
Tubular, Standard No. 1, ℘ doz....8.25 @ 8.50
Tubular, Lift Wire, No. 0, ℘ doz....8.50
Tubular, Lift Wire, No. 1, ℘ doz....10.00
Guards for Tubulars, add ℘ doz....25
Police, Small, $6.00; Med., $7.25; Large, $8.75.dis 10@15 %
Porter's Tin R. R....$10 dis 20 %
Owl....$9, dis 20@25

Lawn Mowers.
Standard Machines ... dis 50&5 %
Cheaper Machines ... dis 50&10 @ 60 %

Lemon Squeezers.
Porcelain Lined, No. 1 ... ⅌ doz. $6.00, dis 25&30 %
Wood, No. 2 ... ⅌ doz. $3.00, dis 35 %
Wood, Common ... ⅌ doz $1.70 @ 1.75
Dunlap's Improved ... ⅌ doz. $3.75, dis 20 %
Sammis' ... No. 1, $5; 2, $9; 12, $18 ⅌ doz. dis 25&10 %
Jennings' "Star" ... ⅌ doz $2.50
The "Boss" ... ⅌ doz $2.50
Dean's ... Nos. 1, ⅌ doz $6.50; 2, $3.35; 3, $1.90
Little Giant ... dis 50 %
King ... dis 40&5 %

Lines.
Cotton and Linen Fish, Draper's ... dis 50 %
Draper's Chalk ... dis 60 %
Draper's Mason's Linen, 84 ft., No. 1, $1.20; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25 ... dis 25 %
Cotton Chalk ... dis 55 %
Silver Lake, Braided, Nos. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ⅌ gross ... dis 25 %
Masons' Linen, No. 3½, $1.50; No. 4, $2; No. 4½, $2.50
Masons' Colored Cotton ... dis 45
Wire Clothes, No. 18, $3.75; No 19, $3.25; No. 20, $2.75.
Ventilator Cord, Samson Braided, White or Drab Cotton ... $7.50 ⅌ doz. dis 20%

Locks, Padlocks, Cabinet Locks, &c.
Door Locks, Latches, &c.—
List, Dec. 18, 1885 ... dis 45&2 @ 45&7½&2 %
Nimick & Brittan's Burglar-Proof Locks ... dis 45&2 %
Reading Hardware Co. (list Feb. 2 1885) ... dis 70 %
Perkins' Burglar Proof ... dis 60&25 %
Plate ... dis 33⅓&2 %
F. Many's "Extension Cylinder" ... $10.50 ⅌ doz net
Barnes Mfg. Co ... dis 40 %
Yale Flat Key ... dis 40 %
Dietz Flat Key ... dis 30 %
L. & C. Round Key Latches ... dis 40&10 %
L. & C. Flat Key Latches ... dis 33⅓&10 %
Romer's Night Latches ... dis 20 %
Yale new list ... dis 40 %
"Shepardson" or "U. S." ... dis 35 %
"Felter" or "American" ... dis 40&10 %
Seed's N. Y. Hasp Lock ... dis 25 %
Cabinet—
Eagle, Gaylord Parker and Corbin ... List March, '84, revised Jan. 1, '85 ... dis 40&2
Deitz, Nos. 36 to 39 ... dis 40 %
Deitz, Nos. 51 to 63 ... dis 40 &10 %
Dietz, Nos. 86 to 96 ... dis 30 %
Stoddard Lock Co ... dis 30 %
"Champion" Night Latches ... dis 40 %
Yale ... dis 40 %
Barnes Mfg. Co ... dis 40 %
Eagle and Corbin Trunk ... dis 25&2 %
"Champion" Cabinet and Combination ... dis 33⅓ %
Romer's ... dis 25 %
Padlocks—
Russell & Erwin, Mallory, Wheeler & Co., Nimick & Brittan Mfg. Co., Wm. Wilcox & Co., Norwich Lock Co. ... List Dec. 23, 1884. Dis 70&5@70&10&5 %
Yale Lock Mfg. Co. s ... dis 40 %
Eagle ... dis 25&2 %
Eureka, Eagle Lock Co ... dis 40&2 %
Romer's, Nos. 0 to 91 ... dis 35 %
Romer's, Nos. 200 to 505 ... dis 20 %
A. E. Dietz ... dis 40 %
"Champion" Padlocks ... dis 33⅓ %
Hotchkiss ... dis 30 %
"Star" ... dis 45 %
"Horse Shoe." ⅌ doz., $9 ... dis 40 %
Barnes Mfg. Co ... dis 40 %
Nock's ... dis 30 %
Brown's Patent ... dis 25 %
Scandinavian ... dis 90 %
Fraim's Pat. Scandinavian, new list (low) ... dis 60 %

Lumber Tools.
Ring Peavies, "Blue Line" Finish ... ⅌ doz $20.00
Ring Peaves, Common Finish ... ⅌ doz $18.00
Steel Socket Peavies ... ⅌ doz $21.00
Mall. Iron Socket Peavies ... ⅌ doz $19.00
Cant Hooks, "Blue Line" Finish ... ⅌ doz $16.00
Cant Hooks, Common Finish ... ⅌ doz $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish ... ⅌ doz $16.00
Cant Hooks, Mall. Socket Clasp Common Finish ... ⅌ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Fin. ⅌ doz $14.00
Cant Hooks, Clip Clasp, Common Finish ... ⅌ doz $12.00
Hand Spikes ... ⅌ doz 6 ft., $15.00; 8 ft., $20

	12 ft.	14 ft.	16 ft.	18 ft.	20 ft.
Pike Poles, Pike & Hook, ⅌ doz.	$11.50	12.50	14.50	17.50	21.50
Pike Poles, Pike only, ⅌ doz.	10.00	11.00	13.00	16.00	20.00
Pike Poles not Ironed, ⅌ doz.	6.00	7.00	9.00	12.00	16.00
Setting Poles, ⅌ doz.	14.00	15.00	17.00	....	....

Swamp Hooks ... ⅌ doz $18.00
Landing Blocks ... ⅌ doz $22.50
Skidding Tongs ... ⅌ doz $51.00
Log Binders ... ⅌ doz $26.00
Bended Boot Calks, 1 to 5 M, dis 25 %; 5 to 10 M, dis 30 %
Square Steel Boot Calks ... dis 40 %
Chain Rafting Dogs ... ⅌ 100 $12.50
Ring Rafting Dogs ... ⅌ 100, med., $10.00; large, $12.00
Timber Grapples ... ⅌ doz $30.00

Lustre.
Four-ounce bottles ... ⅌ doz, $1.75; ⅌ gro. $17.00 net

Mallets.
Hickory ... dis 20&10 %
Lignumvitæ ... dis 20&10 %
Penfield Block Co, Hickory and L. V. ... dis 30 @ 30&10 %

Mattocks.
Regular list ... dis 60 @ 60&10 %

Meat Cutters.
Dixon's—Nos. 1, 2, 3, 4; ⅌ doz. $14.00, 17.00, 19.00, 30.00—dis 45&5 %
Woodruff's ... Nos. 100, 150; ⅌ doz. $15.00, 18.00—dis 45&5 %
Champion ... Nos. 200, 300, 400; ⅌ doz. $22.00, 27.00, 40.00—dis 45&5 %
Hales' ... Nos. 11, 12, 13; ⅌ doz. $27.00, 33.00, 45.00 — dis 70 @ 70 &5 %
American ... dis 35 %
Nos. 1, 2, 3, 4B; Each $5.00, 7.00, 10.00, 25.00, 50.00, 60.00
Enterprise ... dis 30 %
Nos. 10, 12, 22, 32, 42; Each $3 00, 2.50, 4.00, 6.00, 10.00
Pennsylvania ... dis 40&10 %
Nos. 1, 2, 3, 00; ⅌ doz. $24.00, 28.00, 36.00, 28.00
Miles' Challenge ... Nos. 1, 2, 3; ⅌ doz. $22.00, 30.00, 40.00—dis 45@45&5 %
Kieser's No. 55 ... $40 ⅌ doz, dis 40 @ 40&10 %
Kieser's Gem ... $25 ⅌ doz, dis 40 @ 40&10 %
Kieser's Monarch ... $45 ⅌ doz, dis 40 @ 40&10 %
Kieser's Butcher ... $40 each, dis 20 @ 20&5 %
Draw Cut ... Nos. 5, 2, 6, 8; Each ... $50.00, 75.00, 80.00, $25.00—dis 20 @ 25 %
Beef Shavers (Enterprise Mfg. Co.) ... dis 20&10 @ 30 %
Chadborn's Smoked Beef Cutter ... ⅌ doz, $66.00

Mincing Knives.
Am. (2d quality), ⅌ gro, 1 blade, $7; 2 blades, $12; 3 blades, $18 ... Net
Lothrop's ... dis 20&10 %
Smith's, ⅌ doz, Single, $2.00; Double, $3 ... dis 40@45 %
Knapp & Cowles ... dis 50&10@60 %

Molasses Gates.
Stebbins' Pat's ... dis 70&10@75&5 %
Stebbins' Genuine ... dis 66⅔&10 %
Stebbins' Tinned Ends ... dis 40&10 %
Chase's Hard Metal ... dis 50&10 %
Bush's ... dis 20 %
Lincoln's Pattern ... dis 66⅔&10 %
Weed's ... dis 20&10 %
Boss Nos. 1, 2, 3, 4; $7.00, 8.00, 9.00, 10.00 ... ⅌ doz, dis 60&10&10 %

Money Drawers.—⅌ doz., $18.
Muzzles.—Safety, ⅌ doz, $3 ... dis 25 %

Nails ... See Trade Report
Wire Nails, list April 13, 1886 ... dis 50 @ 50&10 %
Wire Nails, Standard Penny. ⅌ keg, card rate, $3.75@$4
Wire Carpet Nails ... See Tacks

Nail Puller.
Curtiss Hammer ... ⅌ doz $9.00 net
Giant, No. 1 ... ⅌ doz $30.00, dis 10 %
Pelican ... ⅌ doz $9.00, dis 25 %
Boss ... ⅌ doz $30, dis 30 %

Nuts and Washers.
Square Nuts, ⅜ and smaller ... 9½¢ off list
Square Nuts, 7-16 and larger ... 8½¢ off list
Hexagon Nuts, ⅜ and smaller ... 10½¢ off list
Hexagon Nuts, 7-16 and larger ... 9½¢ off list
Washers, ⅜ and smaller ... 9½¢ off list
Washers, 7-16 and larger ... 8½¢ off list
In lots less than 100 ℔, ⅌ ℔ add ½¢ to list, 1 ℔ boxes, 1¢ to list.

Nut Crackers.
Table (Humason & Beckley Mfg. Co.) ... dis 40 %
Blake's Pattern ... ⅌ doz $2.00, dis 10 %
Turner & Seymour Mfg. Co ... dis 50 %

Oakum.
Government ... ⅌ ℔ 7¢
U. S. Navy ... ⅌ ℔ 6½¢
Navy ... ⅌ ℔ 5½¢

Oilers.
Zinc and Tin ... dis 65&5@70 %
Brass and Copper ... dis 50&10 %
Malleable, Hammers' Improved, No 1, $3.60; No. 2, $4.00; No. 3, $4.40 ⅌ doz ... dis 10 @ 10&10 %
Malleable, Hammers, Old Pattern, same list ... dis 40 %
Prior's Patent or "Paragon" Zinc. dis 60&5 @ 60&10 %
Prior's Patent or "Paragon" Brass ... dis 50 %
Olmstead's Tin and Zinc ... dis 60 %
Olmstead's Brass and Copper ... dis 50 %
Broughton's Zinc ... dis 60 %
Broughton's Brass ... dis 50 %

Packing, Steam.
N. Y. Belting & Packing Co ... dis 50 @ 50&10 %
American Packing ... 10¢@11¢
Russia Packing ... 14¢
Italian Packing ... 14 @ 15¢
Cotton Packing ... 15 @ 18¢

Padlocks.—See Locks.

Pails, Galvanized Water.

Quarts	10	12	14
Hill's Light Weight, ⅌ doz	$2.75	3.00	3.25
Hill's Heavy Weight, ⅌ doz	3.00	3.25	3.75
Whiting's	2.75	3.00	3.25
Fire Buckets	2.75	3.25	3.50

Buckets, see Well Buckets.

Pencils
Faber's Carpenters' ... high list, dis 50 %
Faber's Round Gilt ... ⅌ gro $5.25 net
Dixon's Lead ... ⅌ gro $4.50 net
Dixon's Lumber ... ⅌ gro $6.75 net
Dixon's Carpenters' ... dis 40&10 %

Picks.
Railroad, 5 to 6, $11.00; 6 to 7, $12 ... dis 60 @ 60&10 %
Adze Eye, 5 to 6, $12.00; 6 to 7, $13 ... dis 60 @ 60&10 %

Picture Nails.
Brass Head, Sargent's list ... dis 50&10&10 %
Brass Head, Combination list ... dis 50&10 %
Porcelain Head, Sargent's list ... dis 50&10&10 %
Porcelain Head, Combination list ... dis 40&10 %
Niles' Patent ... dis 40 %

Pinking Irons ... ⅌ doz 65¢ ne

Pipe, Wrought Iron.
1¼ and under, Plain ... dis 42½ %
1¼ and under, Galvanized ... dis 32½ %
1½ and over, Plain ... dis 57½ %
1½ and over, Galvanized ... dis 40 %
Boiler Tubes ... dis 52½ %

Planes and Plane Irons.
(Small extras often given by Jobbers.)
Wood Planes—
Molding ... dis 15&2 %
Bench, First Quality ... dis 20&2 %
Bench, Second Quality ... dis 25&2 %
Iron Planes—
Bailey's Stanley R. & L. Co.) ... dis 20&10 %
The Stanley (S. R. & L. Co.) ... dis 20&10 %
Bailey's "Victor" ... dis 20&10 %
Steer's Iron Planes ... dis 35 %
Meriden Mal. Iron Co.'s Iron Planes ... dis 20&10 %
Davis's Iron Planes ... dis 20&10 %
Plane Irons—
Plane Irons ... dis 20&10 %
Plane Irons, Butcher's ... $5.00 @ $5.25 to £
Plane Irons, Buck Bros ... dis 30 %
Plane Irons, Middlesex Mfg. Co., "Baldwin Iron," Single and Cut ... dis 20 @ 25 %
Double ... dis 33⅓ @ 40 %
L. & I. J. White ... dis 25 %

Pliers and Nippers.
Button's Patent ... dis 30&10 @ 40 %
Hall's Pat. Compound Lever Cutting Nippers, No. 2, 5 in., $13.50; No. 4, 7 in., $21.00 ⅌ doz dis 20&10@33⅓ %
Humason & Beckley Mfg. Co ... dis 60 %
Gas Pliers ... dis 60 %
Gas Pliers, Custer's Nickel Plated ... dis 60&5 %
Eureka Pliers and Nippers ... dis 40 %
Russell's Parallel ... dis 25 %
P. S. & W. Cast Steel ... dis 50 %
P. S. & W. Tinners' Cutting Nippers ... add 6 % dis 10 %

Plumbs and Levels.
Standard List ... dis 70&10@70&10&10 %
Disston's ... dis 45&10 %
Pocket Levels ... dis 70&10@70&10&10 %
Davis' Inclinometers ... dis 10&10 %

Poppers, Corn.
Round or Square, 1 qt ... ⅌ gro $14.50 @ $15
Round or Square, 2 qt ... ⅌ gro $25 @ $26

Post Hole and Tree Augers and Diggers.
Samson Post Hole Digger ... ⅌ doz $36.00, dis 20&10 %
Fletcher Post Hole Augers ... ⅌ doz $36.00, dis 20 %
Eureka Diggers ... ⅌ doz $16 @ $17
Leed's ... ⅌ doz $8.00 @ $9.00
Vaughan's Post Hole Auger, per doz, $24.00 ... dis 33⅓ @ 33⅓&5 %
Kohler's Little Giant ... ⅌ doz $18.00
Kohler's Hercules ... ⅌ doz $16.00
Kohler's New Champion ... ⅌ doz $9.00
Schneidler ... ⅌ doz $16 @ $17
Ryan's Post Hole Diggers ... ⅌ doz $24
Cronk's Post Bars ... doz $60, dis 50&5 @ 50&10 %

Potato Parers.
White Mountain ... ⅌ doz $5.00 @ 5.50
Antrim Combination ... ⅌ doz $8.00
Hoosier ... ⅌ doz $13.50

Pruning Hooks and Shears.
Disston's Combined Pruning Hook and Saw. ⅌ doz $18.00 ... dis 20&10 %
Disston's Pruning Hook ... ⅌ doz $12.00, dis 20&10 %
E. S. Lee & Co.'s Pruning Tools ... dis 40 %
Pruning Shears, Henry Pat ... ⅌ doz $3 75 @ $4.00 net
Henry's Pruning Shears ... ⅌ doz $4.25 @ $4.50 net
Wheeler, M. & Co.'s Combination ... ⅌ doz $12, dis 20 %
Dunlap's Saw and Chisel ... ⅌ doz $8.50, dis 30 %
J. Mallinson & Co ... No. 1, $5.25; No. 2, $7.25

Pulleys.
Hot House, Awning, &c ... dis 66⅔&10 %
Japanned Screw ... dis 66⅔&10 %
Brass Screw ... dis 70&10 %
Japanned Side ... dis 66⅔&10 %
Japanned Clothes Line ... dis 60&10 %
Hay Fork, Solid Eye, $4.00; Swivel, $4.50 ... dis 50&10 @ 50&10&5 %
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70 ... dis 50 %
Hay Fork, "F" Common and Pat. Bushed ... dis 20 %
Hay Fork, Tarbox Pat. Iron ... dis 20 %
Hay Fork, Reed's Self-Lubricating ... dis 60 %
Shade Rack ... dis 45 %
Tackle Blocks ... See Blocks

Pumps.
Cistern, Best Makers ... dis 50 %
Pitcher Spout, Best Makers ... dis 60 %
Pitcher Spout, Cheaper Goods ... dis 70 @ 70&5 %

Punches.
Saddlers' or Drive, good quality ... ⅌ doz 65¢ @ 70¢
Bemis & Call Co.'s Cast Steel Drive ... dis 50&5 %
Bemis & Call Co.'s Springfield Socket ... dis 50&5 %
Spring, good quality ... ⅌ doz $2.50 @ $2.60
Spring, Leach's Patent ... dis 15 %
Bemis & Call Co.'s Spring and Check ... dis 40 %
Solid Tinners' ... ⅌ doz $1.44, dis 55 %
Tinners' Hollow Punches ... dis 20&2 %

Rail.
Sliding Door, Wrought Brass ⅌ ℔ 35¢, dis 20@25 %
Sliding Door, Bronzed Wrt. Iron ... ⅌ foot 7¢
Sliding Door Iron, Painted ... ⅌ foot 4¢, dis 20&10&5 %
Barn Door, Light ... Inch ½, ⅝, ¾; Per 100 feet ... $2.50, 3.00, 4.40—dis 10 %
B. D. for N. E. Hangers—Small, Med., Large; Per 100 feet ... $2.15, 2.70, 3.25 net
Terry's Wrought Iron, 5¢ ⅌ foot ... net
Victor Track Rail, 7¢ ⅌ foot ... dis 50&2 %

Rakes.
Cast Steel ... dis 60&10 @ 60&10&10 %
Malleable ... dis 60&10 @ 60&10&10 %
Piqua Handle and Mfg. Co ... dis 70 %

Razor.
J. R. Torrey Razor Co ... dis 20%
Wostenholme & Butcher ... $10 to £, dis 10 %

Razor Strops.
Genuine Emerson ... dis 60 @ 60&5 %
Imitation Emerson ... ⅌ doz $2.00, dis 20&10&10 %
Torrey's ... dis 20 %
Badger's Belt and Combination ... ⅌ doz $2
Lamont Combination ... ⅌ doz $4

Rivets.
Black and Tinned Iron, Flat Head M Rivets (in packages and in bulk); Block and Carriage (in C packages) ... dis 50 %
Iron Rivets (other than above) in bulk; Black and Tinned Burrs ... dis 45 %
Bay State, ordinary, in bulk ... dis 55 %
NOTE.—Rivets are frequently sold at concessions from above prices.
Copper Rivets and Burrs ... dis 60&5 @ 60&10 %

Nos.	7	8	9	10	11	12	13	14	15
⅌ ℔	49¢	50¢	52¢	54¢	56¢	58¢	60¢	65¢	70¢

Rivet Sets ... dis 50&2 @ 50&10 %

Rods.
Stair, Brass ... dis 25&5 %
Stair Black Walnut ... ⅌ doz 50¢

Rollers.
Barn Door, Sargent's list ... dis 60&10&10 %
Acme (Anti-Friction) ... dis 55 %
Union Barn Door Roller ... dis 70 %

Rope.
Mnf'rs list, May 13, 1886. (Dis 1@1½¢ ⅌ ℔.)
Manila ... ½ inch and larger ⅌ ℔ 13 ¢
Manila ... ⅜ inch ⅌ ℔ 13½¢
Manila ... ¼ and 5-16 inch ⅌ ℔ 14 ¢
Manila Tarred Rope ... ⅌ ℔ 12½¢
Manila, Hay Rope ... ⅌ ℔ 13 ¢
Sisal ... ½ inch and larger ⅌ ℔ 9 ¢
Sisal ... ⅜ inch ⅌ ℔ 9½¢
Sisal ... ¼ and 5-16 inch ⅌ ℔ 10 ¢
Sisal, Hay Rope ... ⅌ ℔ 9 ¢
Sisal, Tarred Rope ... ⅌ ℔ 8½¢
Sisal, Single Ply Lath Yarn ... ⅌ ℔ 8 ¢
Cotton Rope ... ⅌ ℔ 15 @ 18¢ net
Jute Rope ... ⅌ ℔ 7¢

Rules.
Boxwood ... dis 80&10 %
Ivory ... dis 55 @ 55&10 %
Stephens' Ivory ... dis 50 %

Sad Irons.
From 4 to 10, at factory ... ⅌ 100 ℔ $2.35 @ $2.50
Self Heating ... ⅌ doz. $9.00 net
Self-Heating, Tailors' ... ⅌ doz. $18.00 net
Gleason's Shield and Toilet ... dis 25 %
Mrs. Pott's Irons, Double Pointed ... dis 40 @ 40&5 %
Mrs. Pott's Irons, Square Back ... dis 40 @ 40&5 %
Enterprise Star Irons, new list, July 20, 1882 ... dis 40 %
Combined Fluter and Sad Iron ... ⅌ doz. $15.00, dis 15 %
Fox Reversible, Self-Fluter ... ⅌ doz., $24.00 net
Chinese Laundry (N. R. Butt Co.) ... 8½¢, dis 15 %
New England ... 5¢, dis 15 %

Sand Paper and Emery Paper.
List April 19, 1886 ... dis 25 @ 27 %

Sash Cord.
Common ... ⅌ ℔, 11¢ @ 11½¢
Patent ... ⅌ ℔, 12½ @ 14¢
White Cotton Braided, fair quality ... ⅌ ℔ 28¢ @ 29¢
Common Russia Sash ... ⅌ ℔ 14¢
Patent " ... " 18¢
Cable Laid Italian " ... " 26¢
India Cable Laid " ... " 14¢
Silver Lake, A Quality, White ... 50¢, dis 10&10&5 %
Silver Lake, A Quality, Drab ... 55¢, dis 10&10&5 %
Silver Lake, B Quality, White ... 50¢, dis 10&10&5 %
Silver Lake, B Quality, Drab ... 55¢, dis 10&10&5 %
Silver Lake, C Quality, White (only) ... 28¢ @ 29¢
Sylvan Spring, A Quality, 50@55¢, dis 10&10@10&10&10¢
Samson, Braided, White Cotton ... 50¢ dis 20@20&5 %
Samson, Braided, Drab Cotton ... 55¢ dis 20@20&5 %
Samson, Braided, Italian Hemp ... 55¢ dis 20 @ 20&5 %
Samson, Braided, Linen ... 80¢ dis 20 @ 20&5 %

Sash Locks.
Clark's No. 1, $10.00; No. 2, $8.00 ⅌ gross ... dis 33⅓ %
Ferguson's ... dis 33⅓ %
Morris ... dis 50&10 %
Morris' Triumph, list Jan. 1, 1886 ... dis 50&10 %
Walker's ... dis 10 %
Attwell Mfg. Co ... dis 25 @ 33⅓ %
Hammond's Window Springs ... dis 40 %
Common Sense, Japanned, Coppered and Bronzed ... ⅌ gross
Common Sense, Nickel Plated ... ⅌ gross $12.00 net
Universal ... dis 30 %
Kempshall's Gravity ... dis 60 %
Kempshall's Model ... dis 60@60&10 %
Corbin's Daisy, list February 15, 1886 ... dis 70 %
Payson's Perfect ... dis 50&10&5 @ 60 %
Hugunin's New and Improved Adjustable Sash Balances, list March, 1885 ... dis 33⅓ %
Hugunin's New Sash Locks, list March, 1885 ... dis 33⅓ %
Stoddard "Practical" ... dis 10 %
Ives Patent ... dis 55 %
Liesche's Nos. 100 & 110, ⅌ gro, $8; 105, $10, dis 20&10 %

Sash Weights.
Solid Eyes, in ton lots ... ⅌ ton, $20

Sausage Stuffers or Fillers.
Miles' "Challenge" ... ⅌ doz. $20, dis 50@50&5 %
Perry ... ⅌ doz. No. 1, $15; No. 0, $21, dis 50@50&5 %
Draw Cut No. 4 ... each, $30.00, dis 20 %
Enterprise Mfg. Co ... dis 20&10 @ 30 %
Silver's ... dis 25 %

Saws
Disston's Circular, Mill and Cross Cut ... dis 45&10 %
Disston's Hand, Panel, Rip, &c ... dis 20&10 %
Atkins' Circular ... dis 50 %
Atkins' Silver Steel Diamond X Cuts ... ⅌ foot 75¢
Atkins' Concave Tooth Dexter X Cuts ... ⅌ foot 55¢
Atkins' Special Steel Diamond X Cuts ... ⅌ foot 32¢
Atkins' Champion and Electric Tooth X Cuts ... ⅌ foot 30¢
Atkins' Hollow Back X Cuts ... ⅌ foot 21 @ 22¢
Atkins' Shingle, Mulay, Drag, &c ... dis 45 %
W., M. & C., Hand ... dis 30 @ 30&5 %
W. M. & C. Champion X Cuts, Regular ... ⅌ foot 26¢
W. M. & C. X Cuts, Thin Back ... ⅌ foot 29¢
Peace Circular and Mill ... dis 45&10 %
Peace Hand Panel and Rip ... dis 20&10 @ 20&10&5 %
Peace Cross Cuts, Standard ... ⅌ foot 25¢
Peace Cross Cuts, Thin Back ... ⅌ foot 28¢
Peace Band Saws, all widths ... dis 20&10 %
Richardson's Circular ... dis 45 %
Richardson's Mill ... dis 45 %
Richardson's X-Cuts, No. 1, 30¢; No. 2, 27¢; No. 3, 25¢
Boynton's Lightning Panel, Butcher, &c ... dis 25&10 %
Boynton's Lightning X Cuts ... ⅌ ft 32¢ @ 33¢
Boynton's Lightning One Man X Cuts ... ⅌ ft 38¢ @ 40¢
Boynton's Lightning Buck Saws ... ⅌ doz $6.00, dis 10 %
Hack Saws—
Griffin's Hack Saws, complete ... dis 40&10 @ 50%
Griffin's Hack Saw, Blades only ... dis 40&10 @ 50 %
Star Hack Saws and Blades ... dis 25 %
Diamond, Hack Saws and Blades ... dis 25 %

Saw Frames.
White, Vermont ... ⅌ gro $12 @ $11
Red, Polished and Varnished ... ⅌ doz $1.50, dis 10@15 %
Saw Rods ... $10 list dis 10&10 %

Saw Sets.
Stillman's Genuine ... ⅌ doz $5.00 and $7.75, dis 40&5 %
Stillman's Imita. ⅌ doz $3.25 and $5.25, dis 40&5@40&10%
Common Lever ... ⅌ doz $2.00, dis 40&5 %
Leach's ... No. 0, $8.00; No. 1, $15.00, dis 15 @ 20 %
Nash's ... dis 20&10 @ 20&10&10 %
Hammer, Hotchkiss ... $5.50, dis 10 %
Hammer, Bemis & Call Co.'s new Patent ... dis 30&5 %
Bemis & Call Co.'s Lever and Spring Hammer ... dis 30&5 %
Bemis & Call Co.'s Plate ... dis 10 %
Bemis & Call Co.'s Cross Cut ... dis 12½ %
Aiken's Genuine ... $13.00, dis 50&10 %
Aiken's Imitation ... $7.00, dis 55&5 %
Hart's Patent Lever ... dis 20 %
Disston's, Star, $9, No. 15 Hammer, $5.50 ... dis 20&10 %
Atkins' Adjustable ... per doz $6.00
Atkins' Criterion ... per doz $7.00
Morrill's, No. 1, $15.00; Nos. 3 and 4, $24 ... dis 40&10 %
Croissant (Keller) No. 1, $15.00; No. 2, $24.00, dis 33⅓&10 %
Boynton's No. 1, $12 ⅌ doz; No. 2, $10 ... dis 25 %

Saw Tools.
Atkins' Patent ... per doz sets $6.00

Scales.
Hatch, Counter, No. 171 ... ⅌ doz $21
Hatch, Tea, No. 161 ... ⅌ doz $7.50
Union Platform, Plain ... $2.25 @ 2.30
Union Platform, Striped ... $2.40 @ 2.50
Chatillon's Grocers' Trip Scales ... dis 50 %
Chatillon's Eureka ... dis 25 %
Chatillon's Favorite ... dis 40 %
Family, Turnbull's ... dis 30@30&10 %

Scale Beams.
Scale Beams, List of Jan. 12, 1882 ... dis 60&5 @ 60&10 %
Scale Beams, Custer ... dis 30@33⅓ %

Scrapers.
Adjustable Box Scraper (S. R. & L. Co.) $6.50, dis 20&10 %
Box, 1 Handle ... ⅌ doz $4.00, dis 10 %
Box, 2 Handle ... ⅌ doz $6.00, dis 10 %
Defiance Box and Ship ... dis 20&10 %
Foot ... dis 50&10@60 %
Ship, Common ... ⅌ doz $3.50 net
Ship, Providence Tool Co ... dis 10 %

Screen Window and Door Frames.
Porter's Pat. Window and Door Frame ... dis 33⅓ %
Screen Corner Irons, Warner's ... dis 33⅓ %

Screw Drivers.
Douglas Mfg Co ... dis 20&10&10 %
Disston's ... dis 45&10 %
Disston's Patent Excelsior ... dis 45&10 %
Buck Bros ... dis 30 %
Stanley R. & L. Co.'s Varnished Handles ... dis 60&10 %
Stanley R. & L. Co.'s Black Handles ... dis 50&10 %
Sargent & Co.'s Nos. 1 & 20 Forged Blade ... dis 70&10 %
Sargent & Co.'s Nos. 40 & 30, Cast Steel ... dis 60&10 %
Sargent & Co.'s No. 60, Round Blade ... dis 60&10 %
Knapp & Cowles' No. 1 ... dis 60&20 @ 70 %
Knapp & Cowles' No. 1 Extra ... dis 60 @ 60&10 %
Knapp & Cowles No. 00 & 4 ... dis 50&5 @ 50&10 %
Sets interchangeable ... ⅌ doz $18.00, dis 25 %
Champion ... dis 25 %
Clark's Patent ... dis 20&10 @ 33⅓ %
Crawford's Adjustable ... dis 30 %
Knapp & Cowles' Screw-Driver Bitts ... ⅌ doz 90¢
Ellrich's Socket and Ratchet ... dis 25 %
Allard's Spiral, new list ... dis 25 %
Kolb's Common Sense ... ⅌ doz $6, dis 25&10 %
Syracuse Screw-Driver Bits ... dis 30 & 30&5 %

Screws.
Wood Screws—List, February 15, 1886. (5 @ 7½ % often given.)
Flat Head Iron ... dis 75&10 %
Round Head Iron ... dis 70&10 %
Flat Head Brass ... dis 75 %
Round Head Brass ... dis 70 %
Flat Head Bronze ... dis 75 %
Round Head Bronze ... dis 70 %
Machine—
Flat Head, Iron ... dis 60 %
Round Head, Iron ... dis 55 %
Bench and Hand—
Bench, Iron ... dis 55&10 @ 55&10&10 %
Bench, Wood, Beech ... ⅌ doz $2.25
Bench, Wood, Hickory ... dis 20&10 %
Hand, Wood ... dis 25&10 @ 25&10&5 %
Lag or Coach ... dis 75 @ 75&10&5 %
Coach, Patent Gimlet Point ... dis 75 @ 75&5 %
Bed ... dis 25&5 %
Hand Rail, Sargent's ... dis 66⅔&10 %
Hand Rail, Humason, Beckley & Co.'s ... dis 70&10@75 %
Hand Rail, Am. Screw Co ... dis 70 %
Jack Screws, Millers Falls ... dis 50 %
Jack Screws, P. S. & W ... dis 35 %
Jack Screws, Sargent ... dis 60&10 @ 60&10&5 %

Scroll Saws.
Lester, complete, $10.00 ... dis 25 %
Rogers, complete, $4.00 ... dis 25 %

Scythes.—(Association prices.)
Grain Scythes—
Clipper, Full Polished, Boxed & Sharp ... ⅌ doz $8.90
German, Cast or Silver Steel, either Half Set or Waldron, in Straw ... ⅌ doz $8.35
Grass Scythes—
Silver Clipper, Boxed and Sharp ... ⅌ doz $7.00
German Steel, Half Set Waldron ... ⅌ doz $6.10
Cast Steel and German Steel, Full Set or Waldron, Sharp and Boxed ... ⅌ doz $6.70
Bush, Bramble and Weed ... ⅌ doz $6.70
Clover ... ⅌ doz $7.00
Imperfect Grass and Bush ... ⅌ doz $5.00
Imperfect Grain ... ⅌ doz $6.70
NOTE.—The above prices are frequently shaded by jobbers, who give an extra 5 or 10 %.

Scythe Snaths ... dis 40&5&2 %

Shears.
American (Cast) Iron ... dis 75&10 @ 75&10&5 %
Pruning ... See Pruning Hooks and Shears
Barnard's Lamp Trimmers ... ⅌ doz $3.75
Tinners' ... dis 20&2 %
Seymour's, List, Dec., 1881 ... dis 60&10&5 %
Heinsch's, List, Dec., 1881 ... dis 60&10 %
Heinsch's Tailor's Shears ... dis 33⅓ %
First quality C. S. Trimmers ... dis 30 %
Second quality C. S. Trimmers, dis 80&10 @ 80&10&5 %
Acme Cast Shears ... dis 10&10 %
Diamond Cast Shears ... dis 10 %
Clipper ... dis 10&10 %
Victor Cast Shears ... dis 75&10 %
Howe Bros. & Hulbert, Solid Forged Steel ... dis 40 %

Sheaves.
Sliding Door—
M. W. & Co., list Dec. 18, 1885 ... dis 45&2 %
R. & E. list Dec. 18, 1885 ... dis 60&2 %
Corbin's list ... dis 60&10&2 %
Patent Roller ... dis 60&10&2 %
Patent Roller, Hatfield's ... dis 70 %
Russell's Anti-Friction, list Dec. 18, 1885 ... dis 60&2 %
Moore's Anti-Friction ... dis 60 %
Sliding Shutter—
R. & E. list Dec. 18, 1885 ... dis 60&10&2 %
Sargent's list ... dis 60&10&10 %
Reading list ... dis 60&10&10 %

Ship Tools.
L. & I. J. White ... dis 20&5 %
Albertson Mfg. Co ... dis 25 %

Shoes, Horse, Mule, &c.
Horse—
Burden's, Perkins', Phoenix, at factory ... $3.75
Walker's Forged ... $3.75
Mule—Add $1 ⅌ keg.

Shovels and Spades.
Ames' Shovels, Spades, &c., list Nov. 1, 1885 ... dis 20 %
NOTE.—Jobbers frequently give small extras on above.

Griffith's Black Iron ... dis 50&10 %
Griffith's C.S ... dis 50&10 %
Griffith's Steel ... dis 60 @ 60&5 %
Griffith's Solid Cast Steel R. R. Goods ... dis 20 %
Old Colony ... dis 15 @ 15&10 %
St. Louis Shovel Co ... dis 20 %
Hussey, Binns & Co ... dis 20 @ 30 %
Hubbard & Co ... dis 20@20&7½ %
Chisholm ... dis 40 %
Lehigh Mfg. Co ... dis 50&10 %
Payne Pettebone & Son, list January 2, 1882. dis 50&5@50&10 %
Remington's (Lowman's Patent) ... dis 30 @ 30&10 %
Rowland's, Black Iron ... dis 50&10 %
Rowland's Steel ... dis 60&5 %

Shot.
Drop, ⅌ bag, 25 ℔ (2¢ off for cash in 10 days) ... $1.45
Drop, ⅌ bag, 5 ℔ ... 35

Shovels and Tongs.
Iron and Brass Head ... dis 60&10&5@60&10&10 %

Skeins, Thimble.
Western list ... dis 70&10@75 %

Sieves.
Buffalo Metallic, S. S. & Co., new list ... dis 50&25 %
Barler's Flour Sifters ... ⅌ doz $2.25

Sieves, Wooden Rim—	Iron.	Plated.
Mesh 18, Nested, ⅌ doz	65¢	83¢
Mesh 20, Nested, ⅌ doz	80¢	95¢
Mesh 24, Nested, ⅌ doz	95¢	$1.05

Slates.
School, by case ... dis 45 @ 50 %

Soldering Irons.
Covert's Adjustable, list Jan. 1, 1886 ... dis 35&2 %

Spoke Shaves.
Iron ... dis 45 %
Wood ... dis 30 %
Bailey's (Stanley R. & L. Co.) ... dis 40&10 %
Stearns' ... dis 30&10 @ 30&10&10 %

Spoke Trimmers.
Bonney's ... ⅌ doz $10.00, dis 50 %
Stearns' ... ⅌ doz $9.00, dis 20&10 %
Ives' ... No. 1, $15.00; No. 2, $12.00 ⅌ doz, dis 55&10 %
Douglass' ... ⅌ doz $9.00, dis 20 %

Spoons and Forks.
Tinned Iron—
Basting, Central Stamping Co.'s list ... dis 33⅓&2 %
Solid Table and Tea, Central Stamping Company's list ... dis 33⅓&2 %
Buffalo, S. S. & Co ... dis 50&10 %
Silver-Plated—
Meriden Brit. Co., Rogers ... dis 50&5 @ 50&10&5 %
Reed & Barton ... dis 50&5 @ 50&10&5 %
Wm. Rogers Mfg. Co ... dis 60 @ 60&5 %
Simpson, Hall, Miller & Co ... dis 50&10&5 @ 60 %
Holmes, Booth & Haydens ... dis 50&10& @ 60 %
Holmes & Edwards Silver Co ... dis 60 @ 60&10 %
Cast Steel, Silver Plated ... dis 40 %
H. & E. Silver Co. Steel Silver-Plated Teas, $15; Tables, $30 ... dis 50 @ 50&10 %
German Silver ... dis 50 @ 50&5 %
German Silver, Hall & Elton ... dis 40&5 %
Britannia ... dis 60&10 @ 60&10&10 %

Springs.
Elliptic, Concord, Platform and Half Scroll ... dis 60&5 @ 60&10 %

Squares.
Steel and Iron; Nickel-Plated ... dis 70&5@70&10&5 %
Try Square and T Bevels ... dis 60&10 %
Disston's Try Square and T Bevels ... dis 45&10 %
Winterbottom's Try and Miter ... dis 20&10 %

Staples.
Fence Staples, Galvanized ... ⅌ ℔, 4¼ @ 4½¢
Fence Staples, Plain ... ⅌ ℔, 3¼ @ 3½¢

Steelyards ... dis 40&10@50&5 %

Stocks and Dies.
Blacksmith's ... dis 30@30&10 %
"Lightning" Screw Plate ... dis 10&10@25 %

Stone.
Hindostan No. 1, 3½¢; Axe, 4½¢; Slips, 5½¢
Sand Stone ... ⅌ ℔, 2½¢
Washita Stone, Extra ... ⅌ ℔, 25¢
Washita Stone, No. 1 ... ⅌ ℔, 20¢
Washita Stone, No. 2 ... ⅌ ℔, 16¢
Washita Slips, No. 1, Extra ... ⅌ ℔, 50¢
Washita Slips, No. 1 ... ⅌ ℔, 40¢
Arkansas Stone, No. 1, 4 to 6 in ... ⅌ ℔, $1.45@1.50
Arkansas Stone, No. 1, 6 to 9 in ... ⅌ ℔, $1.75
Turkey Oil Stone, Chase ... 4 to 8 in., ⅌ ℔, 60¢
Turkey Slips, Chase ... ⅌ ℔, $2.00
Lake Superior ... ⅌ ℔, 17¢
Lake Superior Slips ... ⅌ ℔, 31@32¢

Stove Boards.
Buffalo Zinc, S. S. & Co ... dis 50&10 %

Stove Polish.
Joseph Dixon's ... ⅌ gro $6.00, dis 10 %
Gem ... ⅌ gro $4.50, dis 10 %
Gold Medal ... ⅌ gro $6.00, dis 25 %
"Mirror" ... ⅌ gro $6.00, dis — %
Lustro ... ⅌ gro $4.75 net
Ruby ... ⅌ gro $3.75 net
Rising Sun ... ⅌ gro $5.75 net
Dixon's Plumbago ... ⅌ ℔ 8¢ net
Boynton's Noon Day, ⅌ gro ... $5.00
Parlor Pride Stove Enamel ... ⅌ gross, $13
Yates' Liquid, 2, 3, 5, 10 gal. cans; ⅌ gal ... $1.00, .90, .75, .65
Jet Black ... ⅌ gro $3.50
Japanese ... ⅌ gro $3.50
Fireside ... ⅌ gro $2.50

Tacks, Brads, &c.
List, Sept. 1, 1882, and supplement, Jan. 1, 1886
American Iron Carpet Tacks, all kinds ... dis 75&10 %
Steel Carpet Tacks, all kinds ... dis 75&10 %
Swedes Iron Carpet Tacks, all kinds ... dis 75&10 %
Swedes Iron Wire Carpet Tacks ... dis 75&5 %
Swedes Iron Tacks ... dis 75 %
Swedes Iron Upholsterers' Tacks ... dis 70&10 %
Tinned Swedes Iron Tacks ... dis 70&10 %
Tin'd Swedes Iron Upholsterers' Tacks ... dis 70&10 %
Gimp and Lace Tacks ... dis 70&5 %
Tinned Gimp and Lace Tacks ... dis 70&5 %
American Iron Cut Tacks ... dis 75&10 %
Copper Tacks ... dis 60&5 %
Copper Finishing and Trunk Nails ... dis 60&5 %
Cigar Box Nails ... dis 55&10 %
Finishing Nails ... dis 55&10 %
Hungarian Nails and Miners' Tacks ... dis 60&5 %
Trunk and Clout Nails ... dis 60&5 %
Tinned Trunk and Clout Nails ... dis 60&5 %
Basket Nails ... dis 60&5 %
Chair Nails ... dis 60&5 %
Common and Patent Brads ... dis 60&5 %
Tinned Capped Trunk Nails ... dis 45 %
Looking-Glass Tacks ... dis 45 %
Picture-Frame Points ... dis 45 %
Leathered Carpet Tacks ... dis 45 %
Brush Tacks ... dis 45 %
Shoe Finders' ... List June 1, 1886, dis 10&5 %
Lining and Saddle Nails, List Jan. 1, 1886:
Silvered ... dis 30 %
Japanned ... dis 20 %
Double-pointed Tacks ... dis 80 @ 80&10 %
Wire Carpet Nails ... dis 50 %
Wire Carpet Nails, R. & E. Mfg. Co ... dis 50 %
Steel Wire Brads, R. & E. Mfg. Co ... dis 50 %

Tap Borers.
Common and Ring ... dis 20&10 %
Ives' Tap Borers ... Nos. 1, 2, 4—dis 15&10 %
Ives' Tap Borers ... Nos. 13, 14—dis 25&10 %
Enterprise Mfg. Co ... dis 20&10 %
Clark's ... dis 33⅓ @ 35 %

Tapes, Measuring.
American ... dis 25&10 %
Spring ... dis 40 %
Chesterman's ... Regular list dis 25 @ 30 %

Thermometers.
Tin Case ... dis 80 @ 80&10 %

Thimble Skeins.—See Skeins.

Ties, Bale.
Steel Wire, Standard list ... dis 50&10 %

Tinners' Shears, &c.
Shears and Snips (P. S. & W.) ... dis 20 @ 25 %
Punches—See Punches.
Snips, J. Mallinson & Co ... dis 33⅓ %

Tinware.
(Extras some times given.)
Stamped, Japanned and Pieced, Central Stamping Co., list June 1, 1886 ... dis 25&2 @ — %
Pieced, S. S. & Co ... dis 30&2 %
Japanned, S. S. & Co ... dis 25&10&2 %
Stamped, S. S. & Co ... dis 33⅓&2 %

Tobacco Cutters.
Enterprise Mfg. Co. (Champion) ... dis 20&10 @ 30 %
Wood Bottom ... ⅌ doz $5.00 @ $5.25
All Iron ... ⅌ doz $4.25
Nashua Lock Co.'s ... ⅌ doz $18.00, dis 50 @ 55 %
Wilson's ... dis 55 %
Clipper (Sargent & Co.) ... ⅌ doz $24, dis 50&10&10 %
Acme ... ⅌ doz $20.00, dis 40 %

Transom Lifters
Wollensak's Patent Iron Bronzed ... dis 50 %
Reiher's Improved Self-Locking (Class 301) ... dis 40 %
Reiher's Improved Set Screw (Class 201) ... dis 45 %
Reiher's (Class 101) ... dis 50&10 %
Excelsior ... dis 50&10&2 %
Shaw's ... dis 45&10 %
Payson's Universal ... dis 40 %

Traps.
Game—
Newhouse ... dis 35 %
Oneida Pattern ... dis 60&10&10 @ 70 %
Game, Blake's Patent ... dis 40&10&5 %
Mouse and Rat—
Mouse, Wood, Choker ... ⅌ doz holes, 15¢
Mouse, Round Wire ... ⅌ doz $1.50, dis 10 %
Mouse, Cage, Wire ... ⅌ doz $2.50, dis 10 %
Mouse, Catch-'em-alive ... ⅌ doz $2.50, dis 15 %
Mouse, "Bonanza" ... ⅌ gross $10 net
Mouse, Delusion ... ⅌ gross $18.00, dis 15 %
Rat, "Decoy" ... ⅌ gross $10.00, dis 10 %
Ideal ... ⅌ gross $10
Cyclone ... ⅌ gross $5.25

Trowels.
Lothrop's Brick and Plastering ... dis 20&10@30 %
Reed's Brick and Plastering ... dis 15 %
Disston's Brick and Plastering ... dis 20&10@20&10&5 %
Peace's Plastering ... dis 25 %
Clement & Maynard's ... dis 20 %
Rose's Brick ... dis 15 @ 20 %
Brade's Brick ... dis 25 %
Worrall's Brick and Plastering ... dis 20 %
Garden ... dis 70 %

Triers.
Butter and Cheese ... dis 25 %

Trucks, Warehouse, &c.
Penfield Block Co.'s list, 1882 ... dis 40 %

Tubes, Boiler.—See Pipe.

Twine.

			BC.	B.
No. 9, Flax Twine,	¼ and ½ ℔ Balls	...	24¢	31¢
No. 12, " "	¼ and ½ "	...	22¢	24¢
No. 18, " "	¼ and ½ "	...	20¢	22¢
No. 24, " "	¼ and ½ "	...	20¢	22¢
No. 36, " "	¼ and ½ "	...	19¢	21¢
No. 264, Mattrass,	¼ and ½ "	...		50¢

Chalk Line, Cotton, ½ ℔ Balls ... 28¢
Mason Line, Linen, ½ " ... 60¢
2-Ply Hemp, ¼ and ½ ℔ Balls (Spring Twine) ... 14½¢
3-Ply Hemp, 1 ℔ Balls ... 15¢
3-Ply Hemp, 1½ ℔ Balls ... 13¢
Cotton Wrapping, 5 Balls to ℔ ... 14¢ @ 20¢
2, 3, 4 and 5 Ply Jute, ½ ℔ Balls ... 11¢
Wool ... 6¢ @ 6½¢
Paper ... 13¢ @ 14¢
Cotton Mops—6, 9, 12 and 15 ℔ to doz ... 17¢

Vises.
Solid Box ... dis 50&10 @ 60 %
Parallel—
Fisher & Norris Double Screw ... dis 15&10 %
Stephens' ... dis 25 %
Parker's ... dis 20 @ 25 %
Wilson's ... dis 55 %
Howard's ... dis 40 %
Bonney's ... dis 4? %
Millers Falls ... dis 40 @ 40&10 %
Trenton ... dis 40&5 @ 40&10 %
Merrill's ... dis 15@20 %
Sargent's ... dis 60&10&10 %
Backus and Union ... dis 4? %
Double Screw Leg ... dis 15&10 %
Prentiss ... dis 25 @ 25&5 %
Simpson's Adjustable ... dis 40
Saw Filers—
Bonney's, Nos. 2 & 3 ... ⅌ doz $15.00, dis 40 %
Stearn's ... dis 40 %
Sargent's ... dis 60&10&10 %
Hopkins' ... ⅌ doz $17.50, dis 10 %
Reading ... dis 37½&10 %
Wentworth ... dis 20&10
Cowell Hand Vises ... dis 20 %
Bauer's Pipe Vises ... dis 10 %

Wagon Boxes
Per lb ... 2½¢

Washer Cutters.
Smith's Patent ... ⅌ doz $12.00, dis 20&10&10 %
Johnson's ... ⅌ doz $11.00, dis 33⅓ %
Penny's ... ⅌ doz Pol. $14; Jap'd, $16, dis 55 %
Appleton's ... ⅌ doz $16.00, dis 60&10 %
Bonney's ... dis 30&10 %

Washers.—See Nuts and Washers.

Wedges.—Iron ... ⅌ ℔ 3½¢
Steel ... ⅌ ℔ 3½¢

Well Buckets, Galvanized.
Hill's ... ⅌ doz, 12 qt., $3.50; 14 qt., $4.50
Iron Clad ... ⅌ doz., 14 qt., $8—dis
Whiting's Flat Iron Band ... ⅌ doz $4.25
Whiting's Wired Top ... ⅌ doz $4.00

Well Wheels—8 in., $1.75; 10 in., $2.05; 12 in., $2.75

Wire.
Iron—
Market, Br't & Annealed, Nos. 0 to 18 ... dis 70 @ 72½ %
Market, Coppered, Nos. 0 to 18 ... dis 65&5 %
Market Galvanized, Nos. 0 to 18 ... dis 60&5 %
Market Tinned, Tinned list, Nos. 0 to 18 ... dis 60&5 %
Stone Bright and Annealed, Nos. 16 to 18 ... dis 65 %
Stone, Bright and Annealed, Nos. 19 to 26 ... dis 67½ %
Stone, Bright and Annealed, Nos. 27 to 36 ... dis 72½ %
Stone, Galvanized, Nos. 19 to 30 ... dis 50&10 %
Stone, Tinned, Tinned list, Nos. 18 to 36 ... dis 50 %
Tinned Broom Wire, Nos. 18 to 24 ... dis 60 %
Annealed Fence, Nos. 8 & 9 ... dis 65 %
Annealed Grape, Nos. 10 to 14 ... dis 65 %
Brass and Copper, new list, Jan. 18, '84, dis 33⅓@30&10
Barb Fence ... See Trade Report
Wire on Spools ... dis 65 %
Malin's Spld. Wire, 1 ℔, ½ ℔ & ¼ ℔ sp'ls ... 40&10&5 %
Cast Steel Wire ... dis 50 %
Stubs' Steel Wire ... $6.00 to £, dis 30 %
Steel Music Wire, Nos. 12 to 30 ... 55¢ ⅌ ℔
Picture Wire ... dis 60&10 %
Barb Wire Safety Guards ... ⅌ 1000 $9.00, dis 25 %
Wire Clothes Lines. See Lines.

Wire Cloth.
Green, drab and black, best quality, ⅌ 100 sq. ft ... $2

Wire Goods.—See Bright Wire Goods.

Wire Rope.—List May 1, 1886 ... dis 33⅓ %

Wrenches.—American Adjustable ... dis 45 %
Baxter's Adjustable "S" ... dis 35&10 %
Baxter's Diagonal ... dis 35&10 %
Coes' Genuine ... cash in 10 days, dis 60&3 %
Coes' "Mechanics'" ... dis 60&10&3 %
Coes' Pattern, Malleable ... dis 80&10 @ 80&10&5 %
Coes' Pattern, Wrought ... dis 80&10 %
Girard Standard ... dis 70&10 %
Girard Agricultural ... dis 80&10 @ 80&10&5 %
Sterling Wrench, Wrought ... dis 80&10 %
Bemis & Call's Patent Combination ... dis 30&5 %
Bemis & Call's Merrick's Pattern ... dis 35 %
Bemis & Call's Brigg's Pattern ... dis 25 %
Bemis & Call's Cylinder or Gas Pipe ... dis 40&5 %
Bemis & Call's No. 3 Pipe ... dis 35&5 %
Aiken's Pocket (Bright) ... $6.00, dis 50&10 %
The Favorite Pocket (Bright) ... ⅌ doz $4.00, dis 40 %
Webster's Patent Combination ... dis 25 %
Boardman's ... dis 25@25&10 %
Always Ready ... dis 25&5 %
Alligator ... dis 40&10 %
Donohue's Engineer ... dis 25 %
Acme, Bright ... dis 60&3 %
Acme, Nickeled ... dis 45 %
Acme, Bicycle, 4½ in ... dis 45 %
Walker's ... dis 60&3 %

Wringers.
(net @ dis 5 %)

	Per doz.
Adams & Co. No. 8	$27.00
Advance	27.00
Excelsior, for Stationary Tubs, No. E, 10-inch	36.00
Excelsior, for Stationary Tubs, No F, 11-inch	40.50
Excelsior, with Folding Bench, No. A, 10-inch	45.00
Excelsior, with Folding Bench, No. B, 11-inch	49.50
"Metropolitan," No. 2	30.00
"Metropolitan," No. 2½	27.00
Novelty, for Common Tubs, No. 2 & 2½, 10 in	27.00
Novelty, for Common Tubs, No. 3 & 3½, 11-in	31.50
No. 99 Improved 2½	20.00
Peerless No. 2½	27.00
Peerless No. 3½	31.50
Universal, No. 2½	27.00
Universal, No. 2	30.00
Universal, No. 1½	31.50
Universal, No. 1¼	36.00
Universal, No. 1	54.00
Universal, for Set Tubs, A 2½	36.00
Universal, for Set Tubs, E 1½	45.00
Universal, for Set Tubs, C 1	63.00

Empire Purchase Gear Wringers— (dis 2 %, Cash in 10 days.)
No. 3, Round or Set Tub, 10-inch roll ... $45
No. 4, Round or Set Tub, 11-inch roll ... 54
No. 5, Round or Set Tub, 12-inch roll ... 63
No. 3, Bench, 10-inch roll ... 58
No. 4, Bench, 11-inch roll ... 68
No. 5, Bench, 12-inch roll ... 75
Empire, Daisy, 10-inch roll ... 20
Eureka ... ⅌ doz $21
Am. M. Co. Wringer No. 2 ... $20
Superior ... $21

Wrought Goods.
Staples Hooks, &c ... dis 80&10 @ 80&20 %

WHOLESALE METAL PRICES, June 30, 1886.

METALS.

IRON.—DUTY: Bars, 8-10¢ to 1 1-10¢ ₩ lb; provided that no Bar iron shall pay a less rate of duty than 35 %. Sheet, 1 1-0¢ to 1 5-10¢ ₩ lb. Band, Hoop and Scroll, 1¢ to 1 4-10¢ ₩ lb. Railroad Bars weighing more than 25 lb ₩ yard, 7-10¢ of 1¢ ₩ lb.

Standard American Pig Iron.

Foundry No. 1 X	₩ ton	$18.00 @ 18.50
Foundry No. 2 X	₩ ton	17.00 @ 17.50
Gray Forge	₩ ton	16.00 @ 16.50

No. 1 Scotch Pig Iron.

Carnbroe	₩ ton	$18.50 @ 19.00
Coltness	₩ ton	19.75 @ 20.00
Shotts	₩ ton	19.75 @ 20.00
Glengarnock	₩ ton	18.50 @ 19.00
Gartsherrie	₩ ton	19.00 @ 19 25
Langloan	₩ ton	19.50 @ 20.00
Summerlee	₩ ton	19.25 @ 19.75
Dalmellington	₩ ton	18.50 @ 19.00
Eglinton	₩ ton	17.50 @ 18.00
Clyde	₩ ton	18.00 @ 18.50

Rails.

Steel, at Eastern mills	₩ ton	$34.50 @ 35.00
Old Rails, Ts	₩ ton	$18.50 @ 19.00

Scrap.

Wrought, ₩ ton, from yard		$18.25 @ 18 50

Bar Iron from Store.

Common Iron:		
⅜ to 1 in. round and square	₩ lb	1.75 @ 1.80¢
1 to 6 in. x ⅜ to 1 in		
Refined Iron:		
⅜ to 2 in. round and square	₩ lb	1.9 @ 2.3¢
1 to 6 in. x ⅜ to 1 in		
1 to 6 in. x ¼ and 5-16	₩ lb	2.10 @ 2.30¢
Rods—⅜ and 11-16 round and sq	₩ lb	2 @ 2.3¢
Bands—1 to 6x3-16 to No. 12	₩ lb	2 @ 2.5¢
"Burden's Best" Iron, base price	₩ lb	2.9¢
Burden's "H. B. & S." Iron, base price	₩ lb	2.5¢
Norway Nail Rods		5 @ 6¢

Sheet Iron from Store.

Nos.		Common American.	R. G. Cleaned.
10 to 16	₩ lb	2.70 @ 3 ¢	3½¢
17 to 20	₩ lb	3 @	3½¢
21 to 24	₩ lb	3 @	3½¢
25 and 26	₩ lb	3.12½ @	3¾¢
27	₩ lb	3.25 @	3¾¢
28	₩ lb	3.37½ @ 3.50	4 ¢

		B B.	2d qual.
Galvanized to 20	₩ lb	5 ¢	4½¢
Galvanized 1 to 24	₩ lb	5½¢	5 ¢
Galvanized, 25 to 26	₩ lb	5¾¢	5¾¢
Galvanized, 27	₩ lb	6¼¢	5¾¢
Galvanized, 28	₩ lb	6¾¢	6¼¢
American Russia	₩ lb	A, 10¢	B, 9¢
Russia	₩ lb	9½¢ @ 10½¢	
American Cold Rolled B. B	₩ lb	5 ¢ @ 7 ¢	

Iron Wire.—*(See Wire.)*

STEEL.—DUTY: Ingots, Bars, Sheets, &c., valued at 4¢ ₩ lb or less, 45 % ad. val.; valued above 4¢ and not above 7¢ ₩ lb, 2¢ ₩ lb; valued above 7¢ and not above 10¢ ₩ lb, 2¾¢ ₩ lb; valued above 10¢ ₩ lb, 3½¢ ₩ lb. *Extras.*—Steel Bars, Rods, &c., cold hammered or polished, in any way in addition to ordinary hot rolling, 1½¢ ₩ lb in addition to above; Steel Circular Saw Plates, 1¢ ₩ lb in addition to the above.

American Cast Steel.

For American Steel, see Pittsburgh quotations.

Chrome Steel.

Foo. Steel, ordinary sizes, ⅜ to 3 inches, net		10 @ 14¢
Adamantine Shoes and Dies		8 @ ..¢
Magnet Steel		14 @ ..¢

English Steel.

Best Cast	₩ lb	15 ¢
Extra Cast	₩ lb	16½ @ 17 ¢
Circular Saw Plates	₩ lb	14 ¢
Round Machinery, Cast	₩ lb	10 ¢
Swaged, Cast	₩ lb	16 ¢
Best Double Shear	₩ lb	15 ¢
Blister, 1st quality	₩ lb	14 ¢
German Steel, Best	₩ lb	10 ¢
2d quality	₩ lb	9 ¢
3d quality	₩ lb	8 ¢
Sheet Cast Steel, 1st quality	₩ lb	15 ¢
2d quality	₩ lb	14 ¢
3d quality	₩ lb	12½¢

TIN.—DUTY Plates, Sheets, Tagger and Terne, 1¢ ₩ lb; Bars, Block and Pigs free.

Banca	₩ lb	24 ¢ @ 25 ¢
Straits	₩ lb	23½¢ @ 24 ¢
English	₩ lb	23½¢ @ 24½¢
Bar	₩ lb	24 ¢ @ 25 ¢

Charcoal Tin Plates.

I C 10x14 225 sheets	₩ box	$5.00 @	7.50
I C 12x12 225 sheets	"	5.25 @	7.50
I C 20x28, 112 "	"	10.25 @	15.25
I X 10x14 225 sheets	"	6.25 @	9.25
I X 12x12 225 sheets	"	6.25 @	9.50
I X 14x20, 112 "	"	6.25 @	9.25
D C 12½x17, 100 "	"	5.00 @	5.50
D X 12½x17, 100 "	"	6.25 @	7.00
For each additional X add	"	1.25 @	2 00

Coke Tin Plates.

	Best.	Ordinary.
I C 10x14	$4.75	$4.55 @ 4.60
I C 14x20		
I C 12x12	4.87½	4.75 @ ....
I C 10x30, gutters, 225 sheets	8.00	7.25
I C 20x28 112 sheets	9.80 @	10.00

Terne Plates.

	Prime Char.	2d. quality	Coke.
I C 14x20 M.F.	$6.75		
I C 14x20 Old Process			$6.75
I C 20x28 "			13.75
I C 14x20	$4.50 @ 4 75		
X 14x20	6.00 @ 6.50		
I C 20x28	9.00 @ 9.75	8.75	8.50 @ 8.70
I X 20x28	12.00 @ 14.00		
I C 20x200	13.50 @		

Tin Boiler Plates.

I X X 14x26, 2 sheets for No. 7, 112 sheets		@ $12.00
I X X 14x28, 2 " " No. 8, "		@ 13.00
I X X 14x31, 2 " " No. 9, "		@ 15.00

COPPER.—DUTY: Pig, Bar and Ingot, 4¢: Old Copper, 5¢ ₩ lb. Manufactured (including all articles of which Copper is a component of chief value), 35 % ad valorem.

Ingot, Lake	₩ lb	10¼¢ @ 10¾¢
Ingot, Baltimore	"	10 ¢ @ 10¼¢
Ingot Anchor	"	10 ¢ @ 10¼¢
Braziers' Copper and Sheathing, ordinary sizes, 16 oz. ₩ sq. ft. and over		@ 17 ¢
Braziers' Copper and Sheathing, ordinary sizes, under 16 oz. and over 14 oz. ₩ sq. ft.	"	@ 19 ¢
Braziers' Copper, 10 oz. and 12 oz. ₩ sq. ft.		@ 21 ¢
Lighter than 10 oz. ₩ sq. ft.		@ 23 ¢
Circles less than 84 in. in diam.		@ 21 ¢
84 in. diam. and over	"	@ 23 ¢
Segment and Pattern Sheets	"	@ 21 ¢
Locomotive Fire-Box Sheets	"	@ 18 ¢
Bolt Copper	"	@ 18 ¢
Copper Bottoms, 14 oz. to sq. ft. and heavier	"	@ 21 ¢
Lighter than 14 oz.	"	@ 23 ¢

Tinning.

14x48, each	₩ sheet,	6¢
14x48, less than case, each	"	12¢
Boiler sizes, 7 and 8 in., each	"	12¢
Boiler sizes, 9 in., each	"	15¢
Other sizes not larger than 30x60	₩ sq. ft.,	2½¢
Larger than 30x60	"	3¢

Silver-Plated Sheet Copper for Amalgamating, price s furnished upon application.

For tinning both sides, double the above amount.

O'Neill's Patent Planished Copper.—Net.

14x42		
14 and 16 oz. and heavier	27¢	By the case. ₩ lb 26¢
12 oz. and lighter	30¢	" " 29¢

Boiler Sizes.

7 in., 14x52. 8 in., 14x56. 9 in., 14x60.
14 and 16 oz. and heavier. 29¢ By the case. ₩ lb 28¢
(And all sizes not over 20 in. wide.)
24x48 and 30x60.
4 and 16 oz. and heavier ₩ lb 31¢
2 oz " 34¢

Planished Brass same price as Planished Copper

Copper Wire.—*(See Wire.)*

Sheathing Metal.

Yellow Sheathing Metal, ₩ lb		18¢ @ ....

BRASS AND GERMAN SILVER.

Brown & Sharpe's Gauge the Standard for Metal; Old English Gauge the Standard for Wire.

Brass Manufacturers' Price List, January 17, 1884 dis. 20 @ 30 %

LEAD.—DUTY: Pig, $2 ₩ 100 lb; Old Lead, 2¢ ₩ lb; Pipe and Sheet, 3¢ ₩ lb.

Pig		4.95 @ 5.25¢
Bar		5½ @ 5¾¢
Pipe		6¾¢, dis 20 %
Block Tin Pipe		40¢, dis 20 %
Tin Lined Pipe		15¢, dis 20 %
Sheet		7¾¢, dis 20 %
Shot, ₩ bag, 25 lb	Drop, $1.46; Buck,	$1.70
Chilled Shot, ₩ bag, 25 lb		$1.70

ANTIMONY.

Hallett's	₩ lb	9 @ 9¾¢
Cookson	"	9¾ @ 10¼¢

SPELTER—Duty: Pigs, Bars and Plates, $1.50 ₩ 100 lbs.

American, cash		4¾ ¢ @ 5¢
Bergenport		9¢

ZINC—Duty: Pig or Block, $1.50 ₩ 100 lbs. Sheet, 2½¢ ₩ lb.

600 lb casks		5.60 @ 5.87½¢
Zinc.—Open		6¼ @ 6¾¢
Zinc Tubing	dis. 10 @	20 %

Zinc Tubing—Dis. 25 %.

Plain	.27
Fancy	.33
Scotch and Extra Patterns	.36

BABBITT METAL.

N. P. U	₩ lb	6½ @ 7¢
X		.10¢
X X		.15¢
J. B		.20¢

WIRE.

Market Wire.—Put up in 63 lb bundles.

Nos.	00 to 9.	10,	11,	12,	13, 14,	15, 16,	17,	18.
		10	11	11¾	12¾	14	15	16
Bright Market Wire							dis 67½ %	
" Charcoal							dis 47½ %	
" Bale Wire, Nos. 7 to 12							dis 62½ %	
Annealed Market Wire							dis	.67½ %
" Fence Wire, Nos. 8 and 9								
" Grape Wire, Nos. 10 to 14								
Coppered Market Wire							dis. 62½ %	
" Bale Wire, Nos. 7 to 12							dis. 57½ %	
Galvanized Market Wire							dis	.57 ½%
" Fence Wire								

Stone or Weaving Wire.

Nos.	16	17	18	19	20	21	22	23	24	25	26
Cents	14	15	16	19	20	21	22	23	24	25	26
Nos.	27	28	29	30	31	32	33	34	35	36	..
Cents	28	29	30	32	33	35	37	40	45	55	..

Nos. 16 to 18	dis. 70 @	70 %
19 to 26	"	70 %
27 to 36	" 75 @	75 %
Galvanized Stone Wire	"	50 %

Steel Wire.

Cast Steel, Steel Wire list	dis. 50 %

Brass and Copper Wire.

Old English Gauge the Standard.—Dis 20 @ 25.

	Common High Brass	Low Brass	Gilding Bronze and Copper.
All Nos. to No. 16, inclusive	$0.22	$0.26	$0.30
No. 17 and 18	.22	.27	.31
" 19 and 20	.24	.29	.33
" 21	.25	.29	.33
" 22	.26	.30	.34
" 23	.28	.32	.36
" 24	.30	.34	.38
" 25	.32	.36	.40
" 26	.35	.39	.43
" 27	.38	.42	.46
" 28	.42	.46	.51
" 29	.45	.49	.54
" 30	.48	.52	.62
" 31	.51	.55	.67
" 32	.55	.59	.73
" 33	.59	.63	.80
" 34	.64	.68	.95
" 35	.70	.74	1.30
" 36	.76	.80	1.50
" 37	1.00	1.04	1.70
" 38	1.30	1.34	2.00
" 39	2.00	2.00	3.25
" 40	2.60	2.60	5.75

Spring Wire, 2 cents per pound advance. Whitened Wire, 3 cents per pound advance. Flat, Square and Half-Round Wire, 4 cents advance on Round Wire. Fancy Wire, not less than 10 cents advance on Round Wire. Spooling on one-pound Spools, 12 cents per pound extra. Spooling on ten-pound Spools or more, 3 cents per pound extra.

MISCELLANEOUS TINNERS' STOCK.

Solder.

½ & ½, Warranted	15 @	15½¢
Extra	14 @	14½¢
No. 1 Refined	13 @	13½¢
No. 2 Solder	12 @	12½¢
Extra wiping	11¾ @	12½¢

Rivets.

Iron and Tinned, new list, Dec. 10, 1881	dis. 50 %
In bulk, new list, Dec. 10, 1881	dis. 45 %
Copper Rivets and Burrs	dis. 50&10@60 %

Nos.	7	8	9	10	11	12	13	14	15
₩ D.	49¢	50¢	52¢	54¢	56¢	58¢	60¢	65¢	70¢

Stove Bolts.

American Screw Co.'s	dis. 70 %
R. B. & W	dis. 70 %
R. & E. Mfg. Co	dis. 70 %

FRENCH GLASS.

August 20, 1885. Per Box, 50 feet.

Single Thick.

Sizes.	1st. E F H	2d. I E H	3d. H H	4th. H B
25 6 x 8 to 10 x 15	$11.50	$10.50	$10.00	$9.50
40 11 x 14 to 16 x 24	13.00	12.25	11.50	10.75
50 18 x 22 to 20 x 30	17.00	16.00	14.50	13.25
54 15 x 36 to 24 x 30	19.00	17.00	15.00	
60 26 x 28 to 24 x 36	20.00	18.50	16.25	
70 26 x 36 to 26 x 44	21.50	20.00	16.50	
80 26 x 46 to 30 x 50	23.50	22.00	19.00	
84 30 x 52 to 30 x 54	25.00	23.00	20.00	
90 30 x 56 to 34 x 56	26.00	24.00	22.00	
94 34 x 58 to 34 x 60	27.50	26.00	23.50	
100 36 x 60 to 40 x 60	31.00	28.00	25.00	

Double Thick.

Sizes.	1st. E F H D	2d. I E H D	3d. H H D	4th. H B D
25 6 x 8 to 10 x 15	$14.00	$13.50	$13.00	$12.25
40 11 x 14 to 16 x 24	17.00	16.00	15.25	14.50
50 18 x 22 to 20 x 30	22.00	20.50	19.00	
54 15 x 36 to 24 x 30	24.00	22.00	20.00	
60 26 x 28 to 24 x 36	26.00	24.00	21.75	
70 26 x 36 to 26 x 44	27.50	26.00	22.50	
80 26 x 46 to 30 x 50	30.00	28.00	24.50	
84 30 x 52 to 30 x 54	31.50	29.00	26.00	
90 30 x 56 to 34 x 56	33.00	30.50	28.00	
94 34 x 58 to 34 x 60	35.00	34.00	31.00	
100 36 x 60 to 40 x 60	38.00	36.00	34.00	

Sizes above—$15 per box extra for every 5 inches. Discount 75 & 10 @ 75 & 10 & 5 %.

PAPER STOCK, &c.

(Dealers' Selling Prices.)

	Cents	₩ lb.
White Shirt Cuttings, No. 1	6¼ @	6¾
" No. 2	5¾ @	5¾
Mill Assorted Whites	6 @	6
Unbleached Muslins	5¾ @	6
City Whites, No. 1	3½ @	4
City Whites, No. 2	1½ @	2
New Canton Flannels	4½ @	4¾
New Seconds, light	3¾ @	4
" dars	2¾ @	3
Cotton Canvas	4¼ @	4½
Linen Canvas No. 1	4 @	4½
Seconds, City No. 1	1¼ @	1½
Seconds, City No. 2	1 @	1¼
Colors, ₩ cwt	40 @	50
Manila Rope	3½ @	....
" Tarred	3½ @	3¾
Gunny Bagging, No. 1	1½ @	1¾
" No. 2	1¾ @	1¾
Kentucky Bagging	@	....
Burlap Bagging, No. 1	1¾ @	1¾
Tar Shakings	1¾ @	2
Hemp Twine Stock	2¾ @	2¾
Hard White Shavings, No. 1	3¼ @	4
Soft White Shavings, No. 1	2¼ @	2¾
White Shavings, No. 2, Soft	2¼ @	2¾
Mixed Shavings, part White	1¾ @	2
Ledger and Writing	2¾ @	2¾
Solid Stock	1¾ @	2
Book Stock, No 1, light	1 @	1¼
Old Newspapers	1¼ @	1¼
Pure Manilas	1½ @	1¾
Bogus Manilas and Hardwares, cwt	60 @	100
Commons, ₩ 100 lb	55 @	75
Binders' Board Cuttings	½ @	¾
Straw Board Cuttings, ₩ cwt	60 @	75

PAINTS, OILS, &c.

Paints.

Black, Lamp—Coach Painters'	₩ lb	22 @ 24¢
" Ordinary		6¢
Black Ivory Drop, fair		13 @ 16¢
" best		20¢
Black Paint, in oil	kegs, 8¢; assorted cans,	11¢
Blue, Prussian, fair to best		40 @ 55¢
" " " in oil		45 @ 55¢
" Chinese dry		70¢
" Ultramarine		18 @ 30¢
Brown, Spanish		1¼¢
" Van Dyke		10 @ 12¢
Dryers, Patent American	asst'd cans, 9¢; kegs,	7¢
Green Chrome		15 @ 23¢
" " in oil		14 @ 18 @ 25¢
" Paris	good, 20¢; best,	25¢
" " in oil	good, 30¢; best,	35¢
Iron Paint, Bright Red	₩ lb	2½¢
" Brown	"	12½¢
" Purple	"	8¢
Ground in oil, Bright Red		6½¢
" " " Red		5½¢
" " " Brown	"	5½¢
" " " Purple	"	6¢
Litharge		6½¢
Mineral Paints		2 @ 4¢
Orange Mineral		10¢
Red Lead American		6½¢
" Venetian (Eng.) dry		$1.65 @ $1.70
" " in oil	asst'd cans, 11¢; kegs,	8¢
" Indian Dry		9 @ 12¢
Rose Pink		10 @ 12¢
Sienna, American Raw, powdered		4¢
" Burnt, powdered		4½¢
" " in oil		10 @ 16 @ 20¢
" Raw		11 @ 15 @ 25¢
Umber, Burnt, powdered		4 @ 8¢
" " in oil		9 @ 12 @ 15¢
" Raw, powdered		4 @ 7½¢
" " in oil		9 @ 12 @ 15¢
Vermilion, Chinese		80¢
" English		53 @ 58¢
" American, Common		15¢
" " in oil		5¢
White Lead, American, pure dry		7 @ 7½¢
" " in oil		7 @ 7½¢
White Paris, English Prime		2 @ 2½¢
Yellow Ochre, French		$1.40
" " in oil	asst'd cans, 11¢; kegs,	8¢
" Vermont	in casks,	1½¢
Yellow Chrome		17 @ 21¢
" " in oil		14 @ 18 @ 20¢
Zinc White, American No. 1, dry		5 @ 6¢
" " No. 1, in oil		7¢
" French (Paris Dry)		5½ @ 7½¢
" " in oil		10 @ 11¢

Oils.

Bleached Whale, ₩ gal		50¢
" Sperm, ₩ gal		95¢
" Elephant, ₩ gal		90¢
Drilling		55¢
Empire Cylinder		60¢
Engine		40¢
Fish Oil, Pressed		30¢
Lard, Prime Winter		45¢
" No. 1 Extra		41¢
Linseed, Raw, in casks and bbls		39 @ 41¢
" Boiled, " "		42 @ 43¢
" Boiled, " "		39 @ 40¢
" Western, " "		39 @ 40¢
Calcutta		49 @ 50¢
Machinery		30¢
Miners' Oil		30 @ 40¢
Neatsfoot		60¢
Signal		50¢
Tallow		4½¢
West Virginia		9 @ 15¢

Sundries.

Asphaltum, Cuban, ₩ lb		5½ @ 6¾¢
" Egyptian		5 @ 6¾¢
Benzine	₩ gal.	8½ @ 9¾¢
Chalk, ₩ 100 lb		50¢
" Block		75¢
Crucibles No. 14 and upward, per number		37½¢
Grain amery, 300 lb kegs		4 @ 5½¢
Flour Emery, finest quality		7½¢
Frostings		30 @ 35¢
Glue, White		24 ¢ @ .. ¢
" Sheet		.. ¢
Glaziers' Points, Zinc, ₩ box		45¢
Gum, Copal		9¢
" Damar		60¢
" Shellac, English		65¢
" " dark		50¢
Mineral Wool, ordinary, ₩ lb		1 @ 1½¢
" " extra		3 @ 3½¢
Pumice Stone, selected Lumps		3 @ 4¢
" " powdered		2½ @ 3½¢
Pine Tar, bbls		$2.25 @ $3.00
Pitch		3.00
Plumbago E. L. Po., ₩ lb		4 @ 6¢
" American, ₩ lb		6 @ 10¢
" Gun Powder Glazing, ₩ lb		10¢
" Shot Polish ₩ lb		10¢
Putty, in bladders		4¢
" in bulk		1¾ @ 2
Rosin—Common and good—Strained		$3.05
" E & F		$3.40 @ $3.50
" G & H		$3.80 @ $3.85
" I & K		$2.60 @ $2.75
" M & N		$3.25 @ $3.50
Spirits Turpentine, ₩ bbl		35½¢
Stove Polish, Dixon's	₩ gross	$6.00
" Rising Sun	"	5.50
" Gem	"	4.00
" Jet Black	"	3.00
Waste, No. 1 Cop		9¢
" No. 1 White Machine		8¢
" No. 2 White Machine		6½¢
" No. 1 Colored		6½¢
" No. 2 Colored		6¢
" Washed Machine		8½¢
Whiting, Spanish, ₩ 100 lb		60¢

MANUFACTURING.

Iron and Steel.

The firm of Boulton, Brown & Co., who are building the new steel works at Duquesne, 12 miles from Pittsburgh on the P., V. and C. R. R., were merged last week into a company chartered under the act of 1874. The new concern will be called the Duquesne Steel Works. The officers elected are George Boulton, president; Robert B. Brown, vice-president, and W. H. Alldred, secretary and treasurer. All the excavations for the new plant have been made, and work on the foundations has been commenced. Over a mile of standard-gauge track is being constructed. The location of the works has started a new town, which has been named Duquesne.

The annual meeting of the stockholders of the Bethlehem Iron Co., of Bethlehem, Pa, was held on the 22d ult. The Board of Managers presented a report of the company's business for the year. The following were re elected directors: Alfred Hunt, Wm. W. Thurston, Jos. Wharton, F. S. Wilbur, Robert H. Sayre, John Knecht and Robert P. Linderman. The incoming Board of Directors was authorized to increase the indebtedness by placing a mortgage on the works for $1,500,000. The stock vote was the fullest cast at any meeting of the company. The Board of Directors elected the following officers: President, Alfred Hunt; vice-president, Wm. W. Thurston; general manager, Robert H. Sayre; chief engineer and general superintendent, John Fritz; secretary, A. S. Schropp; treasurer, C. O. Brunner.

Part of the machinery in the newly-completed sheet mill of the Sharon Iron Co.'s plant, at Sharon, Pa., was put in operation last week and worked perfectly. The test was merely an experiment, but the new department is to be put in operation this summer. The improvements will cost about $50,000.

The courts have approved the lease of the plant of the Himrod Furnace Co., of Youngstown, Ohio, to the Brier Hill Iron and Coal Co., of that place. Under the terms of the lease, which expires December 31 of the present year, the lessees are to pay a rental of 50 cents per ton for all pig iron produced, and stipulates that in any event the amount paid must not be less than $5400. At present but one stack is in blast, and it is producing over 100 tons per day.

Some large additions are being made to the National Tube Works, at McKeesport, Pa., which will increase the capacity about 40 per cent. Ground has been broken for the erection of 28 puddling furnaces in the rolling mill, which now contains 18 single and 15 double furnaces. The new lap-welding furnaces are almost completed and will be put in operation in a short time. The new butt mill is well under way, and the furnaces have been commenced. The building is assuming prodigious proportions, and when finished will be one of the largest departments of the mill. A new lap-weld furnace will be placed in the present butt mill. A second story is being built at the threading department, and it will almost double the capacity. In all the other departments extensions are being rapidly made.

The North Chicago Rolling Mill Co., at Bay View, Wis., have signed the scale as adopted by the conference committees at Pittsburgh.

The Youngstown Steel Co. erected a plant at Youngstown, Ohio, three years ago for the purpose of making open-hearth steel. By reason of a dull market the plant ran but a short time and has since been idle. Recently the company decided on making steel ingots, and after making the necessary changes the gas was lighted on the 24th ult. The daily production will be 20 tons, and the ingots, which will weigh nearly 1 ton, will be shipped to the Spang Steel Co., of Pittsburgh, for rolling. Should the business prove sufficiently remunerative a plant will be erected by the company for rolling the ingots.

The Apollo Iron and Steel Co., of Apollo, Pa., were chartered on the 21st ult. with a capital stock of $300,000. This company have been in operation for several years, and in order to make a limited corporation it was necessary to obtain a new charter.

McLanahan & Stone, Hollidaysburg, Pa., have just completed a 20-inch nail-plate train, with engine and 25-ton fly-wheel, for the Portage Iron Co., Limited, of Duncansville, Pa.

The Roane Iron Co., of Chattanooga, are about to put up a 4-ton converter, and propose to resume work on the rail mill.

The furnace of the Lynchburg Iron Co., Lynchburg, Va., went out of blast on the 13th ult., after a campaign started on September 5, 1885. During that time there were stoppages for repairs and by floods aggregating 11 days. The furnace produced 11,292 tons, an average of 40⅓ tons per day. It made 2077 tons of No. 1, 5111 tons of No. 2, 3078 tons of No. 3, and 1026 tons of mottled and white iron, the percentage of grades being therefore 18.39 No. 1, 45.27 No. 2, 27.36 No. 3, and 8.98 mottled and white.

The furnace of the Vigo Iron Co., Terre Haute, Ind., will probably blow out in two weeks.

The Cleveland Rolling Mill Co. are running full in all departments, the new rod mill and the hoop mill having resumed within the past few days. The steel works are running the best in their history, and the rail mill is turning out its full capacity.

The Crane Iron Co., at Catasauqua, Pa., are fitting No. 5 Furnace with one of the improved Crane Brothers steam hoists, similar to Nos. 1 and 3. The hoist removed was propelled by water, and throughout the winter the platforms were made dangerous with ice, but the new arrangement is very much superior, and experience with two in use for several years determined the adoption at all the furnaces.

Machinery.

An important decision concerning the Howe Sewing Machine Co., Bridgeport, Conn., was rendered by Judge Beardsley, of the Superior Court, recently. The suit was brought to foreclose a mortgage for $280,000 given by the company to secure bonds issued. Judge Beardsley's decree decided that the amount of the mortgage, with interests and costs, must be paid on or before Monday, June 21, in default of which all the property secured by said mortgages shall be sold at public auction on July 24. James Staples was appointed commissioner to make the sale. The decree makes numerous provisions as to the use to which the money obtained by the sale shall be put.

The Mason Machine Works, Taunton, Mass., have posted the following notice: "We will not close our works, but shall continue to run, whatever the inconvenience or loss may be. We shall fill the vacancies in our working force soon as possible, and the new men who are hired now will not be discharged to make room for any who have left us who may want to return."

The Providence Steam Engine Co., of Providence, R. I., are building and erecting improved Greene engines for the following establishments: Valley Worsted Mills, Horace A. Kimball and Michael Fitzgerald & Co., Providence; Floyd Cranska, Moosup, Conn.; Reading Cotton Mills, Reading, Pa.; J. Morton Browne & Co., Norristown, Pa; Hoyle, Harrison & Kaye, Stead & Miller and Blood & Co., Philadelphia; C. E. Meding, Mauch Chunk, Pa. They have just put in operation a 700-horse-power engine at the Brooklyn Sugar Refining Co,, Brooklyn, N. Y.

The Portland Locomotive Co., of Portland, Me., have just delivered the first of four locomotives building at their works for the Maine Central Railroad. The locomotive weighs 45 tons, and is designed for hauling passenger trains. The cylinders are 17 x 24, and the driving-wheels 5 feet 8 inches in diameter.

The Union Switch and Signal Co., of Pittsburgh, are putting their interlocking switches and signals in for the Baltimore and Potomac, the Philadelphia and Erie and the West Penn roads.

Messrs. Charles and James Mulholland, who purchased the buildings and machinery last year of the Vicksburg (Miss.) Mfg. Co., after having an expert examine the timber adjacent to that city, are so well satisfied with his report that they have ordered $6000 worth of the most improved machinery for manufacturing spokes, wheels, hubs and handles from hardwood.

At the recent tile ditching machine contest at Champaign, Ill., five machines entered for the contest, but only three put in an appearance. Chandler & Taylor, Indianapolis, Ind., exhibited a machine which was awarded the gold medal. The digging part consists of an endless chain or succession of U-shaped buckets, running over an arm, the corner end of which runs upon the bottom of the finished ditch, the upper end being carried upon a pair of wheels which are hitched behind an ordinary portable engine. The machine showed a capacity of 125 rods per 10 hours.

The H. A. Ramsay Engineering Works, Baltimore, are adding an iron foundry to their works.

P. Blaisdell & Co., Worcester, Mass., are running their shop with 85 men full time. They make a specialty of lathes and drill presses, which have recently been improved.

The Roanoke (Va.) Machine Works are running continuously night and day. Two gangs of men are employed. They build locomotives and cars and do repairs. Several hundred hands are employed.

Cramp & Son, Philadelphia, Pa., are building a new iron ferry-boat, 207 feet long, with engine 50 inches diameter, 10 feet stroke; a new steamer for the Morgan Line; repairing the English steamer Eros, which went ashore last April, the repairs estimated to cost $50,000. The collier Hercules is undergoing a thorough overhauling on the railway. They are also building three new steamers for the Southern Pacific and Wm. P. Clyde & Co.

The Risdon Iron Works, San Francisco, are building the large engines and boilers for the new cable railroad at Oakland, Cal. The boilers used will be of the Heine pattern.

The Webster, Camp & Lane Machine Co., Akron, Ohio, now have an order in hand for nine standard hoisters for the Chicago Steel Works. In addition to this they have an order for a large hoist for a coal-mining company in Tennessee and two for iron mines in the Lake Superior region.

Lodge, Davis & Co., of Cincinnati, Ohio, have increased their capacity one third They are now operating 30 lathes, with a corresponding number of planers, milling machines, drills, &c. They are running to their full capacity on advance orders.

The Lehigh Valley shops at Hazleton, Pa., have completed a heavy passenger engine with 24-inch cylinders and 68 inch drivers. The boiler is 58 inches diameter of barrel. This engine is intended to work heavy passenger trains over the mountain division.

The Norfolk and Western Railroad will build a 125,000-bushel grain elevator at Norfolk, Va.

Messrs. Riehlé Brothers, of Philadelphia, Pa., are making for the United States Government, for Mare Island Navy Yard, one of their improved testing machines. It is similar to the one lately selected for Harvard College. Their recent orders are for testing machines for Barnum, Richardson & Co., Wisconsin Construction Co., Pomeroy & Sons; Everett Mills, Lawrence, Mass.; city of Pittsburgh, city of Cleveland; Cincinnati Telephone Co.; improved rope twister for new pipe works, New Philadelphia, Ohio; National Pipe Foundry Co., Scottdale, Pa.; the Jackson and Woodin Mfg. Co.; also scales for Ohio Iron Co., Oxford Iron and Nail Co., Thomas Iron Co.; Noble Brothers, Anniston, Ala.; Tipton Coal Co., Clearfield Consolidation Coal Co.; coal cutting machinery for Saltsburg Coal Co.; steel straightener for Standard Steel Carting Co. In addition to the above a large number of scales of smaller sizes, also trucks, &c., have been ordered and delivered, and the prospects for orders ahead look more favorable than for two years back.

The Clayton Air Compressor Works, of Brooklyn, N. Y., have just received an order for a large Duplex air compressor. The steam cylinders are each 12 inches diameter, stroke 26 inches and air cylinders 8 inches diameter. This machine is capable of taking in 500 feet of gas per minute. It will take about eight weeks to complete the order. The machine will be set up and put in running order at the works, and satisfactorily tested before shipment. It will go to Sydney, Australia, through the commission house of W. H. Crossman & Bro., of New York City, it being the second of this class of machines ordered by this firm for the same parties. It is only recently that our American manufacturers have been able to compete with the English makers for this class of heavy machinery.

Hardware.

Messrs. B. F. Avery & Sons, of Louisville, Ky., resumed operations on Monday, the 21st ult., running full time and force in all branches. The season has begun six weeks earlier than usual, and promises to be one of unusual activity and volume. Messrs. Thos. Meikle & Co. have also begun work in their factory, giving employment to their usual force of hands.

The Wright Wire Cloth Co., successors to Palmer Wire Goods Co., Palmer, Mass., have refitted the buildings formerly occupied by the latter concern, and have increased their facilities by the addition of new machinery. The works are running on wire poultry netting principally, which is marketed through the company's agents, Knapp & Hague, 52 Fulton street, New York.

C. Rogers & Bros., Meriden, Conn., are about to put in their factory two new 90 horse-power boilers, an enlargement of their facilities which is required by the satisfactory condition of their trade.

The Jeffords Axe Co., manufacturers of axes and edge tools generally, picks, mattocks and grub hoes, Jamestown, N. Y., were formerly called the C. L. Jeffords Co., and were run under this name for 35 years. The past year the company were reorganized. The works are reported to be running full time.

Miscellaneous.

A convention of harness manufacturers, under the presidency of George Peters, was held in the Monongahela House, Pittsburgh, last week. A national organization was formed and the following permanent officers elected: President, Owen C. Gothright, Louisville; secretary and treasurer, N. J. Demarest, Newark, N. J.; Executive Committee, W. L. Tompkins, Newark; George Emery, Concord, N. H.; Benj. Bowin, Hartford, Conn., and E. F. Beck, Newark.

The Sumner Glass Co., who have for two years operated the prescription ware glass house at Sumner Station, near Sharpsburg, Pa., have bought a factory at Steubenville with a 10-pot furnace, the lease of the Sumner factory expiring on June 30. The company is a co-operative one composed of glass blowers who struck at Libby Brothers' Sharpsburg factory some years ago. Co-operative factories were at the same time started at Bellaire, Butler and Parkersburg.

The Natural Gas Light Co., lately chartered as an illuminating gas company for the city of Allegheny, are getting ready for work, and will in a few weeks increase their capital stock to $300,000 preparatory to piping Allegheny City and supplying the consumers of that city with illuminating gas at $1 per 1000 feet.

The Ohio Gas Fuel Co. expect to be furnishing the rolling mills of Youngstown, Ohio, with natural gas by August 1. Several mills have under consideration the question of a shut down during July, in order to make the necessary attachments for natural gas.

Capitalists in the Baltimore and Ohio Railroad and Pittsburgh and Western Railroad have organized a company to erect a foot bridge across the Allegheny River from the foot of Thirtieth street, Pittsburgh, to Bridge street, in the Eighth Ward, Allegheny. Among the subscribers to certificates of corporation are James Callery, C. S. Wright, Thomas M. King, John McCleave and J. V. Patton. The bridge will be operated in connection with an incline plane extending to the top of Troy Hill, thus bringing a large and important section of Allegheny City within easy reach of Pittsburgh.

Ex-United States Senator Hill, of Colorado, and Prof. Richard Pearce, of England, were in Pittsburgh last week, looking for a site for the establishment of a metal-refining manufactory. Senator Hill is at the head of the largest metal-refining works in the United States. These are situated at Denver, but that point is too far west to be accessible to the rich silver ores of Mexico, Arizona and New Mexico. The gentlemen were much struck with the facilities offered by natural gas, but have not decided as yet upon a location.

The following table from the *Marquette* (Mich.) *Mining Journal* exhibits in gross tons the total lake shipments of iron ore from the mines of the Marquette and Menominee ranges for the current season up to and including Wednesday, the 23d ult., together with the shipments from the same ports for the corresponding period of last year:

Name of port.	1886.	1885.
Marquette	250,747	196,647
Escanaba	427,096	325,192
L'Anse	.....	8,694
St. Ignace	15,590	23,843
Total	693,343	554,376

The gain over the lake shipments from the mines of the two ranges named for the corresponding period of 1885 is 138,967 gross tons. The shipments from the Gogebic mines for this season to date aggregate 139,236 gross tons. The output of the Vermilion mines being about the same as for the corresponding portion of last year, adding the gain from the Marquette and Menominee mines to the amount sent forward from those of the Gogebic region gives the total gain in the quantity of Lake Superior ore shipped by lake this season over that of 1885. The amount is 268,203 gross tons.

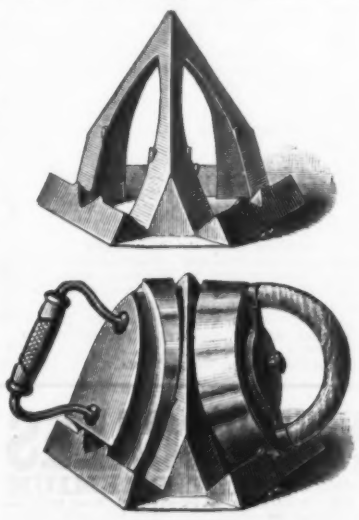
The average shipments from the Connellsville coke region last week were 975 cars, as against 960 two weeks ago. Of these the syndicate ships 730 and the outside producers 245 cars. These are distributed as follows: West of Pittsburgh, 535 cars; east of Connellsville, 210 cars; Pittsburgh and rivers, 230 cars. The figures show an increase of 55 cars west and a decrease of 40 cars east.

An order for 250 cars for the Minneapolis and Pacific Railway has been secured by the Terre Haute Car and Mfg. Co., of Terre Houte, Ind.

Hardware Novelties.

Dome Sadiron Heater.

The Shepard Hardware Co., of Buffalo, N. Y., are introducing a sadiron heater for use on gasoline and oil stoves, which has been named the Dome, and which is very clearly shown in the two engravings presented herewith. It is arranged in such a manner that three irons may be kept in place over the flame instead of one, with the advantage of not heating the handles nearly so much as in the old way. The flame from the gasoline or oil stove is suppose to be directly in the center of the cone, and the little lugs on the side of the



The Dome Sadiron Heater.

panels of the sad heater prevent the irons from closing up the panels entirely, or in other words keep them just far enough away to leave sufficient opening for draft. The heater will, it is claimed, heat three irons as fast as and more evenly than two irons can be heated when set down on the flame, while the handles are not nearly as much heated as in the old way. The heater is adapted for use with either the common form of sadiron or some of the improved varieties. It is stated in the manufacturers' circular that one heater will heat irons enough for two rapid ironers.

Payson's Fish Stringer.

The accompanying illustration clearly represents the construction of this article, the purpose of which is indicated by the name. The size of the stringer is 2 feet 6 inches long by 4 inches wide, and the weight is 12 ounces. The head of the stringer, to which the rope is attached, is made of cast iron or brass, and is provided with two double latch-guards for receiving and hold-

Fish Stringer.

ing safely the upper ends of the stringing wires, and is also so formed as to permit the fastening of a connecting-rod, and is furnished with holes, as indicated, through which the rope passes. The stringer-rod, of ⅛-inch steel or brass spring wire, is passed through an eye in the lower end of the connecting-rod, and is then bent upward, and the two ends sprung into the scroll-shaped latch-guards in the head, as shown in the cut. The outward pressure of the spring wire in connection with the latch-guard holds the two ends of the stringers in place, so that they are not liable to be unfastened by any accidental blow or the struggles of the fish, but at the same time are easily detached and replaced by the hand in stringing the fish. The stringer is intended to be secured to the side of the boat by means of the rope, and, when desired, by unfastening and reversing the wires, the fish can easily be removed.

Chandler's Chamferer.

The cut shows a common draw-knife, with a chamfer guage applied, which Chas. A. Strelinger & Co., of Detroit, Mich., are introducing to the trade. The chamfer gauge consists of a casting that slips over the blade and is held by a thumb-screw at the top. Two of these castings are employed, one of which is slipped against either face of the angle to be chamfered. The depth of

Chandler's Chamferer.

the chamfer, accordingly, is regulated by the space apart at which these gauges are set The gauges are furnished handsomely nickel-plated and are of a size to fit ordinary draw-knives. For many purposes where chamfering is wanted at short notice, and where it can be better done by a draw-knife than any other tool, these gauges would seem to answer a very desirable purpose. At the same time they admit of work being done by a draw-knife in competition with other means for accomplishing the same thing

The Little Giant Ice-Grip.

From the accompanying illustration of this article, which is put on the market by the Little Giant Ice-Grip Co,, 531 Commerce street, Philadelphia, Pa., its construction, something on the principle of the Harpoon hay fork, will be readily understood. The fluted ends are to be pressed into the ice, and by a backward and forward motion the point is to be buried ¾ inch or more into the ice. Then with the thumb and finger of the other hand the ends of the blade are to be pressed together, thus forcing the prongs of the grip into the body of the ice, which can then be readily lifted and disposed of as desired. To release the ice it is necessary to press the grip to the full extent

The Little Giant Ice-Grip.

back into the opening already made, which closes the prongs, permitting the grip to be removed. This tool, the full length of which is about 5½ inches, is especially intended for family use, and in referring to its advantages the point is made that by merns of it any sized piece of ice can be picked up by simply gripping it securely on the top side only, thus enabling the ice to be lowered into the cellar or refrigerator without any danger of injuring the receptacle. They are described as made of the best quality steel, hand forged, properly tempered, having an enameled finished handle and weighing 5 ounces each.

A New Torpedo-Boat.—It is a remarkable fact that the Japanese were the first to introduce seagoing torpedo-boats, the English builders Messrs. Yarrow & Co., of Poplar, having eight years ago constructed a number of such craft for the Japanese Government. The same Government have just initiated a new departure by adopting before any other power torpedo-boats of an armored type, the first of which has just been completed by Messrs. Yarrow. It measures 166 feet in length and 19 feet in beam, and is consequently the largest boat of the kind which has yet been built. It will be propelled by twin screws and driven by engines working up to 1400 horse-power. The principal feature of novelty, however, is that all the vulnerable portions of the vessel, including the machinery, &c., are protected by 1-inch steel armor, which may be considered as an almost perfect defense against machine gun fire, having in view the distance at which a torpedo-boat attacks and the acute angle of fire at which it would be hit. The vessel is being shipped in pieces and will be put together in Japan, and if the trials come up to expectations there is no doubt that this type of torpedo-boat will find favor with many Governments, for not only is good protection obtained, but the vessel, because of its large size, offers greater and more comfortable accommodation for the officers and crew, and is in a special sense deserving to be classed as seagoing. The armament, which has been constructed in France, consists of two torpedo guns in the bow, and the same number of guns placed near the stern and fitted on a revolving turn-table, so as to enable them to be discharged at any angle. The speed expected to be realized is between 19 and 20 knots an hour.

Iron vs. Steel for Blacksmiths' Supplies.

The following interesting letter from Messrs. Hull & Rogers, of Danbury, Conn., who are very large dealers in blacksmiths' supplies, will be found valuable as indicating what their experience has been in the matter of the displacement of iron by steel. They say:

We have been surprised at the slowness of the change. When steel dropped in price to the level of iron we expected to see it supplant the latter very largely and rapidly for general purposes. We put in a full line of steel for wagon and carriage tires, horse and ox shoes, &c., and more particularly of carriage and wagon axles and nails, fully expecting to gradually decrease our purchases of the iron, and finally—especially in case of axles and nails—to drop them altogether and sell nothing but steel. For a while, owing partly to the novelty of the thing and partly to the selling quality of the word "steel," the commodity had a large sale. Presently the "smiths" complained of the hard work, and began to go back to iron for horse and ox shoes, as being much more easily worked and as less likely to split out at the creases—until now we find ourselves again buying and selling 10 tons of horse and ox shoe iron to 1 ton of steel for this purpose. For tires the result has been different, especially in light sizes. The light steel tire has evidently come to stay, and the sale of iron for this purpose, say 1 x ¼ inch and under, has almost entirely ceased. Owing to trouble in bending and welding the heavier sizes in steel, iron is still the favorite. It would seem as if steel would be far preferable to iron for axles, owing to the finer fiber (taking higher finish) as well as its greater tensile strength; but for some reason unexplained, except by some as due to trouble in welding, many customers refuse to take it in place of iron, and our experience has been somewhat the same as with shoe shapes, we finding sale of steel axles rather on the decrease than otherwise. The result of it all is that we have to keep a double stock, complete in all sizes and shapes, and the question of which is the fittest for general purposes is still undecided. Our experience with cut nails made of steel has been very unfavorable. The heads flew off and nails broke in driving. We sold out at a discount, and will not bother with them further unless their popularity increases.

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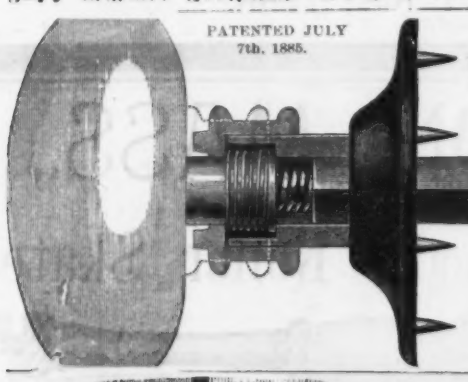

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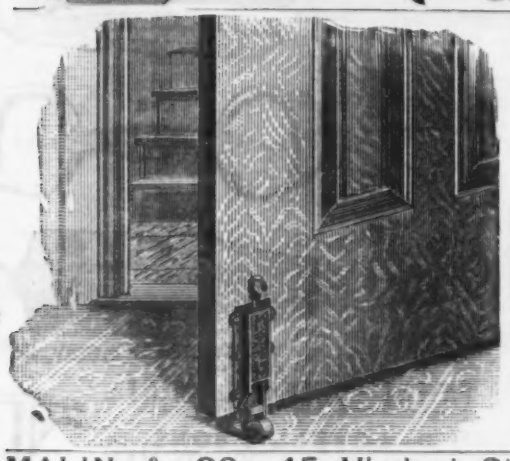

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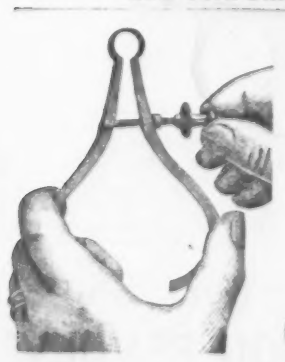

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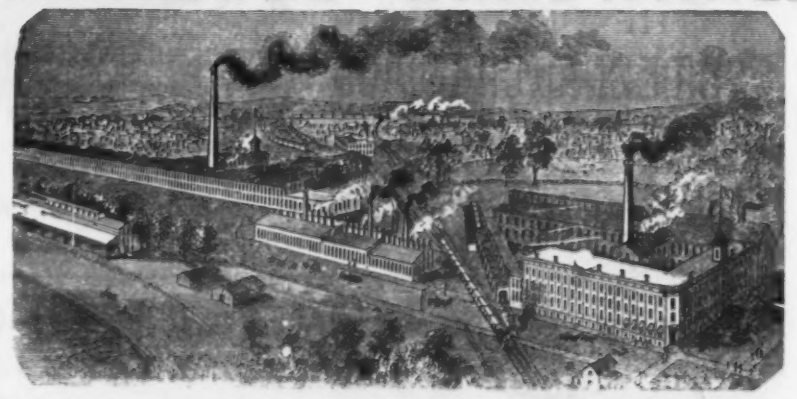

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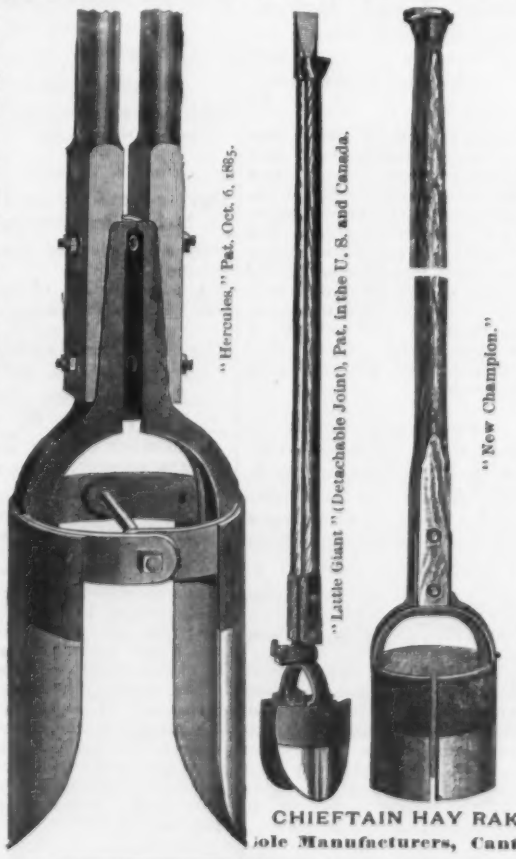

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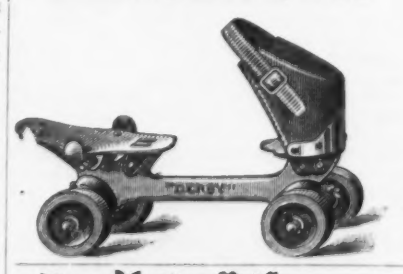

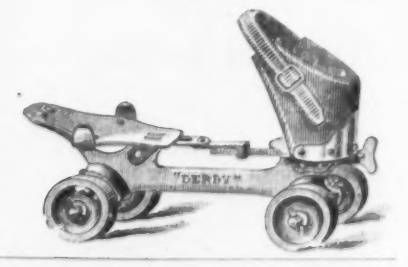

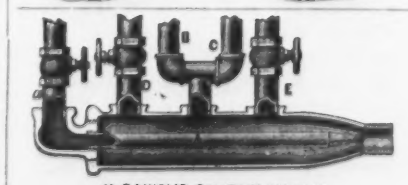

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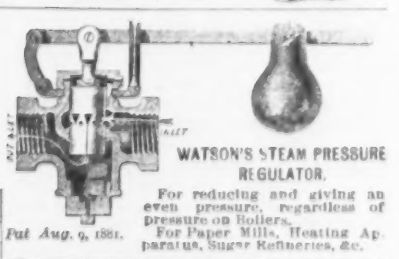

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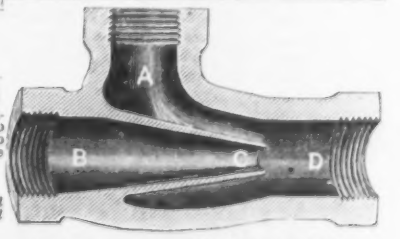

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This work will be found to be thoroughly adapted to the practice of American machinists. It comprises instructions in the selection and preparation of drawing instruments, with elementary instruction in practical mechanical drawing. The illustrations give examples in simple geometry and elementary mechanism, including screw-threads, gear wheels, mechanical motions, engines and boilers.

Construction and Materials.

Modern House Carpenter's Companion and Builder's Guide. By W. A. Sylvester. 3d edition, enlarged, 45 full-page plates containing 109 illustrations, 210 pages, 12mo. cloth $2

This is a well-arranged hand-book for carpenters and builders. It contains rules for getting the lengths and finding the bevels for rafters for pitch, hip and valley roofs; the construction of French and mansard roofs; several forms of trusses and stairs, splayed and circular work, &c.; a table of braces, sizes and weights of window-sash and frames for the same; a table of board, plank and scantling measure; rules for estimating the sizes and capacity of bins for grain, potatoes, coal, &c., also rules for tanks to hold from 5 to 100 gallons; weights and strength of various materials. There is a brief treatise on the use of the slide rule, and there are tables of the diameters, circumferences and areas of circles, rules and examples in simple and compound proportion, square and cube root, mensuration and the metric system of weights and measures.

Stair-Building Made Easy. By F. T. Hodgson 123 illustrations, 123 Pages, 12mo, cloth. . . $1.

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Architects' and Builders' Pocket Companion and Price Book. By Frank Vogdes. Enlarged, revised and corrected. 368 pages, full bound in pocket-book form, $2; cloth. $1.50

This work consists of a short and comprehensive epitome of decimals, duodecimals, geometry and mensuration, with tables of United States measures, sizes, weights, strength, &c., of iron, wood, stone and various other materials, quantities of materials in given sizes and dimensions of wood, brick and stone, together with a full and complete bill of prices for carpenters' work Rules for computing and valuing brick and brickwork, stonework, painting, plastering, &c., are presented.

Rudiments of Practical Bricklaying. By Adam Hammond; illus. by 68 woodcuts, 115 pages, 4 by 7 inches, limp cloth . . . $0.60

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Plasterers' Manual. By K. Cameron; revised edition, 67 pages, 4½ by 6⅞ inches, 10 illustrations, cloth; $0.75

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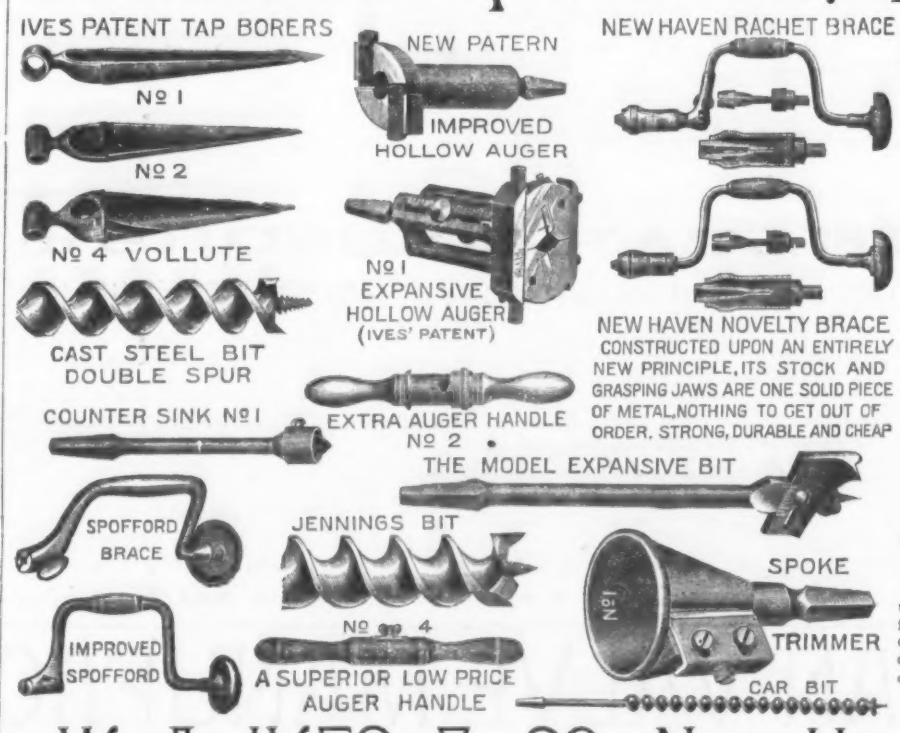

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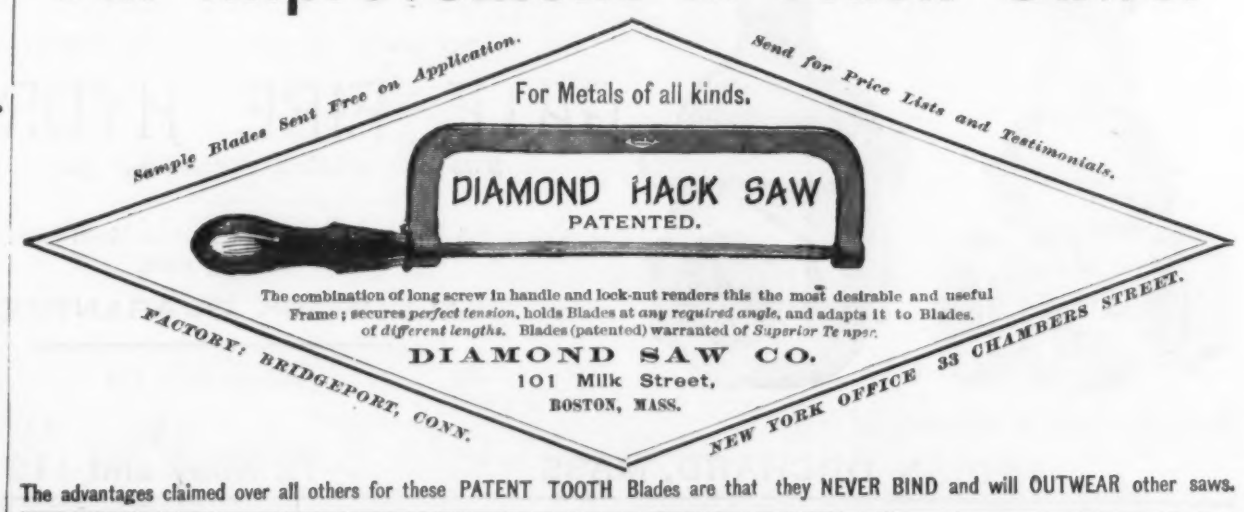

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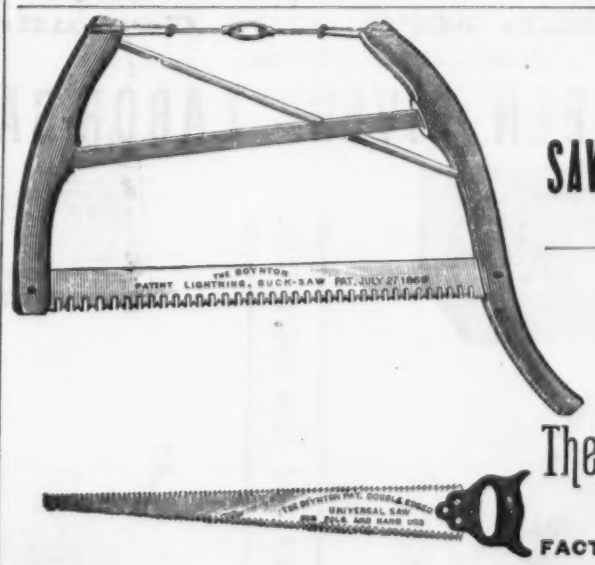

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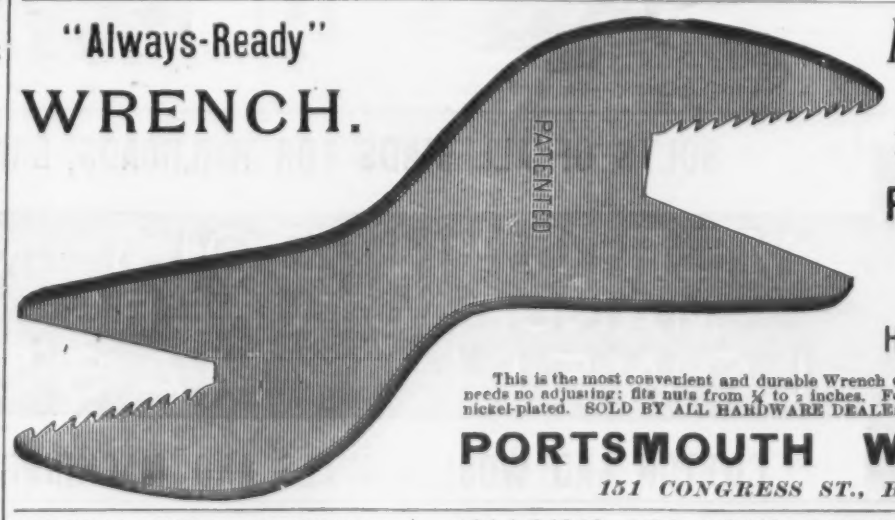

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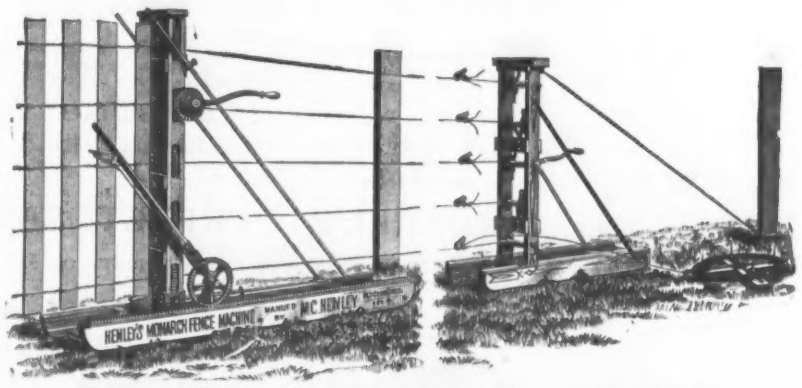

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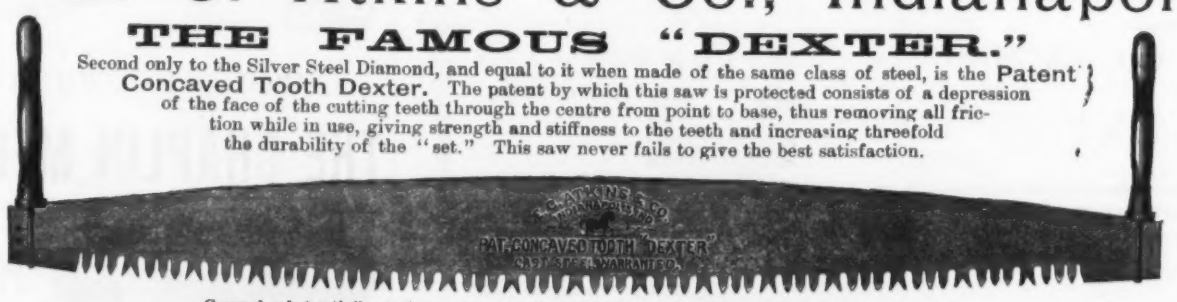

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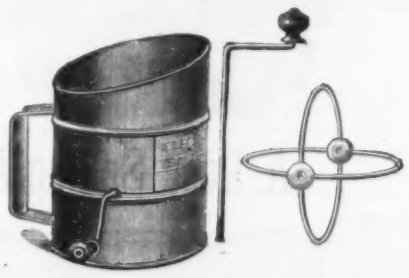

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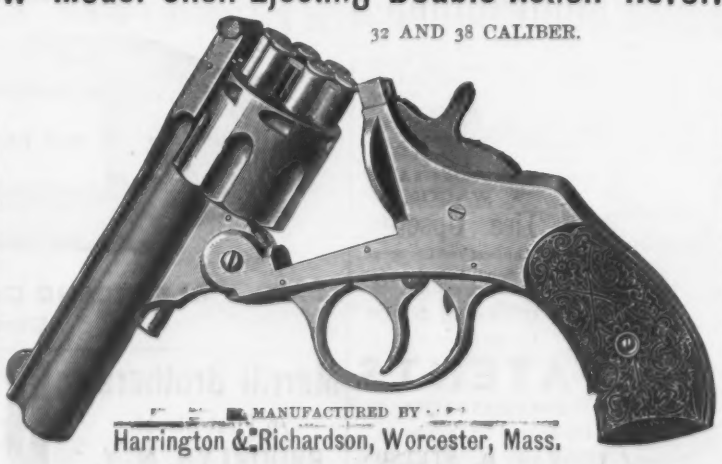

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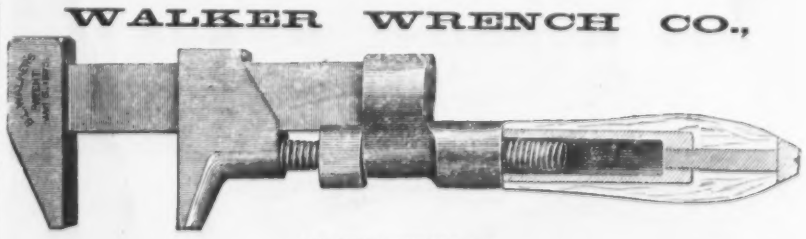

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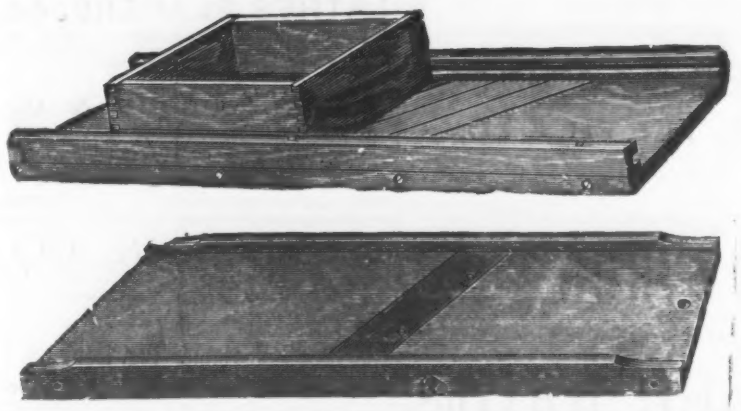

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Genuine Green Paper Brand Washita Stone is the Best
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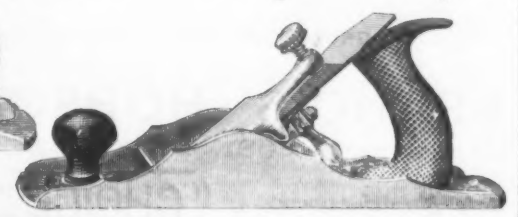
Nos. 20 and 30 Blocks.



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This Cut shows the surface of our new Corrugated Iron Planes. The corrugations afford ample air spaces, and reduce the traction and friction to the minimum. Same price as smooth face.

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These Planes (with a smooth face) have been in the market for many years, obtaining a steadily increasing trade as they have become known. We claim for them the utmost simplicity of construction, prompt adjustment and superior beauty of style and finish.

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CORRUGATED FACE.	SMOOTH FACE.	
	No. 202, Iron Smooth Plane, 7x1⅝ in. Cutter	$3 00
	No. 203, Iron Smooth Plane, 8x1¾ in. Cutter	3 25
	No. 204, Iron Smooth Plane, 9x1¾ in. Cutter	3.35
No. 1205	No. 205, Iron Smooth Plane, 9x2 in. Cutter	3.50
	No. 206, Iron Jack Plane, 12x2	3.85
No. 1207	No. 207, Iron Jack Plane, 15x2⅜	4.25
No. 1208	No. 208, Iron Fore Plane, 18x2¼	5 00
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With Adjustable Throat.

	No. 233, Iron Smooth Plane, 8x1¾	$3.50
No. 1255	No. 255, Iron Smooth Plane, 9x2	3.75

All of these Planes are Nickel-Plated finish.
This Adjustable Mouth Smooth Plane is a new feature, and meets with a great deal of favor.

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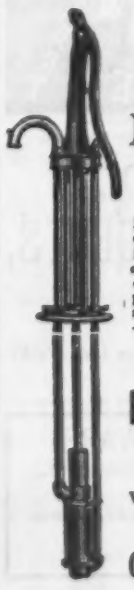

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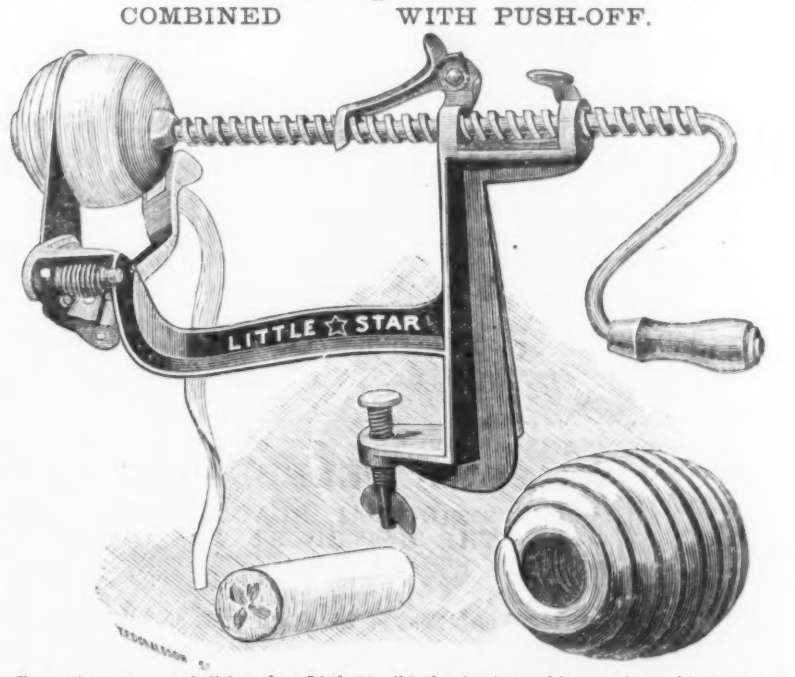

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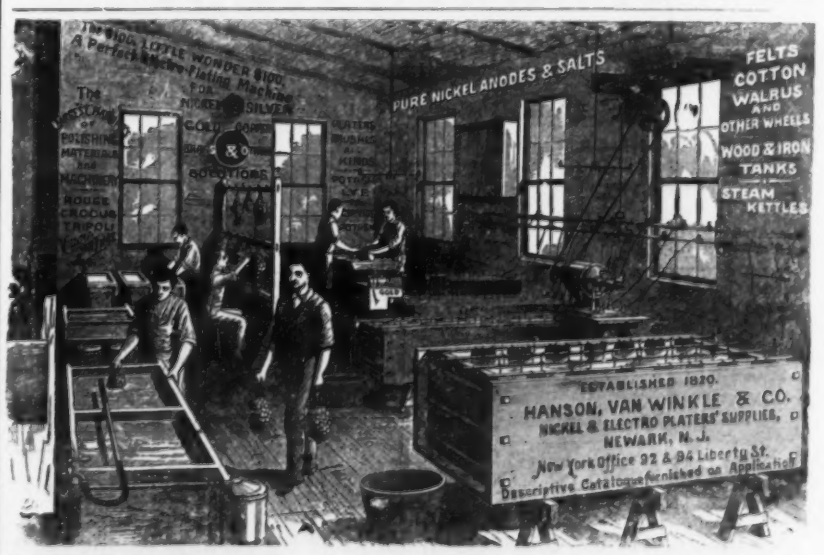

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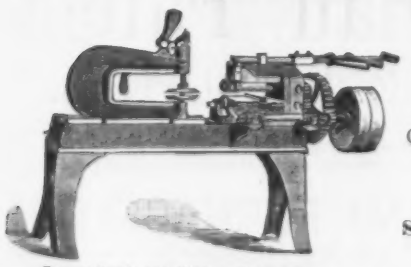

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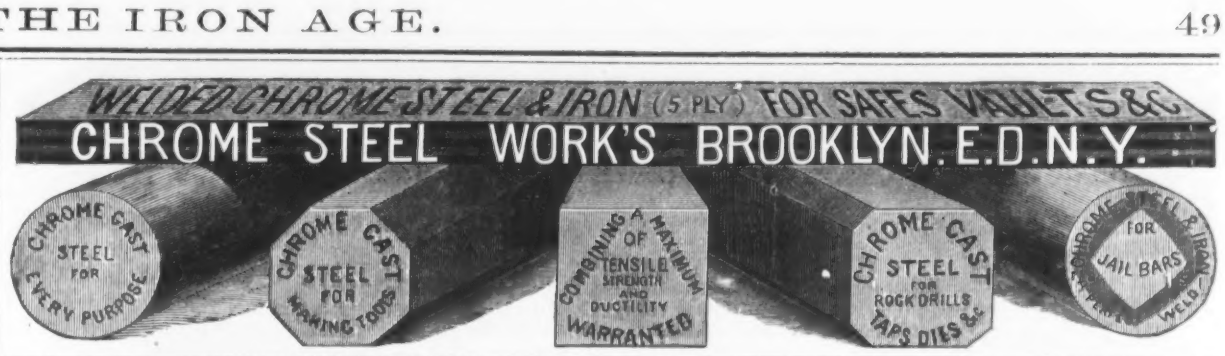

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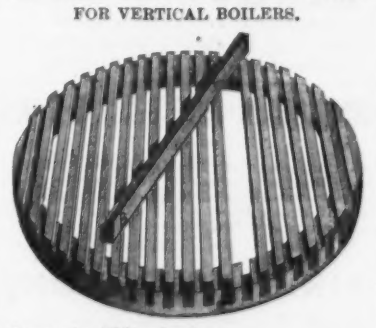

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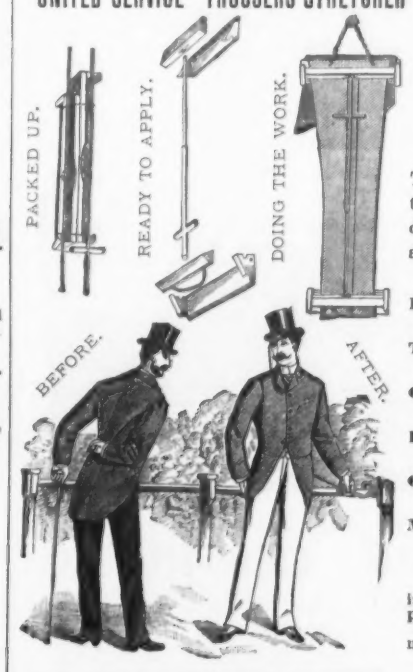


NO MORE BAGGY KNEES.

WHOLESALE DEPOT,

J. C. McCARTY & CO.,

97 Chambers Street, New York.

Trade Lists and Circulars on application.

The patentees of the "United Service" Trousers Stretcher desire to call attention to their great advantages, and have every confidence in recommending them as a very useful and economical invention.

BY THEIR USE *OLD* TROUSERS APPEAR LIKE *NEW.*

THE GENTLE AND INCREASING TENSION DOES NO INJURY.

THERE IS NOTHING TO GET OUT OF ORDER.

THEY ARE PROPERLY AND QUICKLY ARRANGED.

THEY ARE ADAPTED FOR THICK OR THIN MATERIAL.

THEY ARE THE CHEAPEST AND MOST EFFICIENT.

CAUTION.—Legal proceedings will be taken against infringements, and venders of the same will be prosecuted.

Each Stretcher is patent stamped, without which none are genuine.

GREEN, CADBURY & CO.,

Patentees and Manufacturers,

BIRMINGHAM, ENGLAND.

THE Invincible Clothes Wringer

The Best Wringer on Earth

LOVELL MFG. CO.,

LIMITED,

ERIE, PA.,

MANUFACTURERS OF

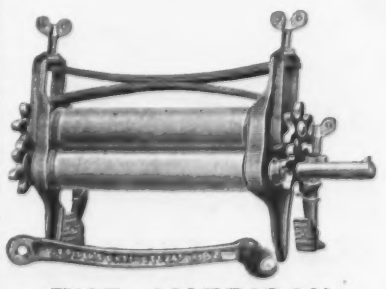
CLOTHES WRINGERS.

Delusion and Bonanza Mouse Traps,

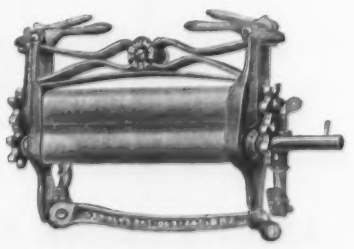
The Folding Wire Rat Trap,

Erie Rat Trap, &c.

SEND FOR CATALOGUE.



THE AMERICAN.



THE TRIUMPH.

In addition to the above Wringers we make the most durable Friction Wringer on the market, called "The Leader," which we make with or without Pressure Screws on top. All these Wringers are made of Galvanized Iron. The Shafts are of Steel, and Black Enamelled Handles, impervious to Alkali or Water. Warranted the Easiest Turning Wringers made, and to Wring Dry.

C. H. GURNEY & CO., 247 & 249 Lake St. & 7 & 9 Market St. Chicago, Ill.

AGENTS FOR THE NORTHWEST.

THE TRIUMPH WRINGER CO., - - KEENE, N. H.

LIESCHE'S

Burglar-Proof Sash Lock

AND

Automatic Window Holder.

Cheapest, Strongest and Only Practical Automatic Lock and Holder on the Market.

SAMPLES FREE TO THE TRADE.

J. R. CLANCY, Svracuse, N. Y.

PHILADELPHIA.

Lloyd & Supplee Hardware Co.
Terms, 30 days. For 60 or 90 days, interest added at 8 per cent. per annum.

Anvils.
Peter Wright's, ℔ ℔ .... 9¾ @ 10¢
Trenton .... 9½¢
Eagle Anvils, American, 10¢ .... dis. 20 %

Apple Parers.
Penn Apple Parers .... $5.00 net
White Mountain 5.00
Lots of 10 to 25 dozen, special prices.

Axes.
Hunt's Kentucky and Yankee, ℔ doz. net $7.00
William Mann, ℔ doz. net 7.00
Favorite ℔ doz. net 6.00
Beveled Axes .... add 50¢
Double Bit Axes, net .... $12.00 @ 13.00
Loveland Axes 6.50

Augers and Auger Bits.—New List January 7 1880.
Snell's Augers and Bits .... dis. 60@60&5 %
New Haven Copper Company .... dis. 60&10&5 %
Benjamin Pierce Auger Bits .... dis. 40 %
Jennings' Auger Bits, new list Jan. 1, 1884, dis. 25 %
Cook's Auger Bits and Augers .... dis 55 %
Snell's Ship Augers .... dis 15 @ 20 %
Watrous' Ship Augers .... dis. 15 @ 20 %
Bonney's Pat. Hol. Augers, list $48 ℔ doz dis .. 40&10 %
Stearns' Pat. Hol. Augers, list $48 ℔ doz ... dis. 20&10 %

Balances.
Light and Common .... dis. 50 %

Bells.
Bevin Bros. Mfg. Co. Light Hand Bells .... dis. 75 %
Light Hand Bells .... dis 75&10 %
Swiss Pattern Hand Bells .... 60 %
Connell's Door Bells .... dis. 20&10 %
Gt. Western & Kentucky Cow, new list .... dis. 70 %

Boring Machines
Upright, without Augers ..... List, $5.50 } ..... dis. 50 %
Angular, without Augers ..... List, 6.75 }

Bolts.—Eastern Carriage Bolts, new list, June 10, 1884 .... dis 75&10&5@80 %
Phila. Carriage Bolts new list .. dis 75&10@75&10&5 %
Stanley, Wrought Shutter .... dis. 60&10 %

Braces.—Barber's Improved .... dis 50 %
Barber's Old Style .... 50&10 %
Backus, Polished .... dis 60&10@60&10&5 %
Backus, Nickeled .... dis. 60@60&10 %
Spofford .... dis 50&5@50&10 %
American Ball .... dis. 55&10 %
Amidon Improved .... dis. 60@60&10&5 %
Amidon Corner Brace .... dis. 40@40&10 %

Butts.
Cast Fast Joint, Narrow .... dis 60 %
Cast Fast Joint, Broad .... dis. 60&10 %
Cast Loose Joint, Narrow }
Cast Loose Joint, Broad }
Cast Acorn, Loose Pin } dis 70 @ 70&10 %
Cast Acorn, Japanned }
Cast Mayer's Loose Joint }
Wrought Loose Pin .... dis 65&5 %
Wrought Table Hinges and Back Flaps .... dis 65 %
Wrought Loose Joint .... dis. 65&5 %
Wrought Narrow Fast .... dis. 65 %

Blind Butts.
Parker .... dis. 75&2 %
Clark .... dis. 80 @ 80&5 %
Shepard .... dis. 75&10&5 @ 80 %
Lull & Porter .... dis. 80&10 %
Huffer's .... dis. 50 %

Casters.—Bed (new list July 1, 1880) Plate .... dis 60 @ 60&5 %

Chains.—German Halter and Coil, list June, 1884 .... dis. 55 @ 55&5 %
Galvanized Pump .... ℔ ℔ 5½@6¢
Best Proof Coil Chain—English.
℔ ℔ 9¼ 6¾ 5¾ 5½ 5 4¾
3-16 ¼ 5-16 ⅜ 7-16 ½

Chisels.—Socket Framing .... dis 75&10@75&10&5 %
Socket Firmer .... dis 75&10@75&10&5 %
Butcher's .... $5.00@$5.25 to £ gold

Coffee Mills.—Box and Side (new list Jan. 1, 1880) .... dis 45&10 %
Enterprise .... dis 20&10@30 %

Cutlery.—Walden Pocket .... new list net
Pennsylvania Knife Co .... new list net
Landers, Frary & Clark, J. Russell & Co., Lamson & Goodnow Mfg. Co. and Meriden Cutlery Co., Manufacturers' prices net.

Door Hangers.—Cronk Barn Door Hangers...No. 4, $12.00; No. 5, $14.00; No. 6, $18.00, dis. 50&5@50&10 %
American Parlor Door Hanger .... $6.00; dis 20&10 %

Drawing Knives.
Hart Mfg. Co.'s .... dis. 75&10&5 %
Adjustable Handle .... dis 20@25 %

Files.
Nicholson .... dis 55@55&5 %
Disston .... dis 55@55&5 %
Butcher ....
Crown and Arrow .... 60&5@60&10 %

Fluting Machines.
Eagle—3½ in. roll .... each, $2.15 } dis 35 %
Eagle—5½ in. roll .... each, 2.85 }
Crown—4½ in. roll .... each, 3.50 }
Crown—6 in. roll .... each, 4.00 } dis 35 %
Crown—8 in. roll .... each, 6.50 }
Geneva Fluter .... dis 25 %
Favorite com. Fluter and Sad Iron .. ℔ doz., $10.50 net

Fry Pans.
Burnished .... dis 70 %

℔ doz.	$3.00	3.75	4.25	4.75	5.25	6.00	7.00	8.00	9.00
No.	0	1	2	3	4	5	6		8

Hammers.
Yerkes & Plumb's, new list .... dis 40&5 @ 40&10 %
Maydole Hammers, new list .... dis 25@25&10 %
Howell A. E. Nail Hammers .... ℔ doz., net $3.75

Handles.
Disston Loop Handles Cross-Cut .... 33¢ pair net
Boynton Loop Handles Cross-Cut .... 20¢ pair net

Hatchets.
Yerkes & Plumb, new list .... dis 40&10 %
Hunt .... dis 40 @ 40&5 %

Hay and Straw Knives.
Lightning .... ℔ doz., $18.00 dis. 20 %
Electric .... ℔ doz., $10.00 @ 12.00
Wadsworth .... ℔ doz., net dis 35&5@40 %
Walton Straw Knives .... ℔ doz., net 17.50
Gem Hay Knife .... ℔ doz $13.50

Hinges.
Strap and T .... dis 65&5 %

Horse Nails.

Nos.	5	6	7	8	9	10	
Globe	26	23	21	20	19	18	dis 10&5&5 %
Ausable	30	27	25	24	23	22	dis 25&10 %
" Pol'ed and P't'd & Blued & P't'd	31	28	26	25	24	23	dis 25&10 %
Clinton		23	21	20	19	18	dis 25&10 %
" Pol'ed & P't'd.		24	22	21	20	19	dis 25&10 %
Saranac		30	23	21	20	19 18	dis 25@30 %

Locks and Knobs.
Branford Locks .... dis 45&2 %
Parker's Cabinet .... dis 40&2 %
American Padlocks .... dis 66⅔&10 @ 66⅔&10&5 %
Scandinavian Padlocks .... dis 50 %

℔ doz.	$5.00	5.50	6.50	7.50	8.50	10.00	12.50	dis 60 %
No.	57	58	59	60	61	62	63	
℔ doz.		$18.00		26.00		33.00		dis 60 %
No.		64		65		66		

Lanterns.
Buckeye .... large list, net; small list, net
Tubular, No. 0, $6.75 @7.00; No. 1, $8.25@8.50 ℔ doz. net
Guards 40¢ extra.

Lawn Mowers.—Pennsylvania }
Philadelphia }
Excelsior } dis 50 %
Continental }
Quaker City }

Lawn and Garden Pumps.
Holland Patent .... list, $5.00, dis 10 %

Mattocks.
Long and Short Cutter .... new list, 60&10 %
Pennsylvania Pattern .... dis 60& 10 %

Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets .. dis. 20&10 %
Stebbins' Gates .... dis. 70&10 %
Lincoln's Gates .... dis. 66⅔&10 %
Landers, Frary & Clark's Petroleum .... dis 40&10 %
Brass Liquor Cocks new list Jan. 1, 1880 .. dis. 55&10 %
Cork Lined Cocks .... dis. 70 %

Meat Cutters.
Dixon's .... dis. 45@5 %
Woodruff .... dis. 45@5 %
Stowe .... dis. 45@5 %
Hale's .... dis. 60&10&10 @ 70 %
American .... dis. 35 %
Stuffers .... dis. 40 %
Enterprise Stuffers .... dis. 30 %

Planes.—Sandusky Tool Co .... dis 20&2 %
Ogontz .... dis. 25&2 %
Ohio and Auburn .... dis. 20&2 %
Bailey (S. R. & L. Co.) .... dis. 20&10 %

Plane Irons.—Ohio Tool Co .... dis. 20&10 %
Butcher's .... $5.00 @ 5.25 to £

Plumbs and Levels.
Stanley's Adjustable .... dis. 70&10 %
Stanley's Non-Adjustable .... dis. 70&10 %

Picks.—New list .... 60 %

Razor Strops.
Lamont Combination .... ℔ doz. $4.00
Lamont Combination .... 1 gross lots $42.00
Imitation Emerson .... ℔ doz. $2.00, 70&10&10 %

Rules.—Stanley Boxwood .... dis. 80&5@80&10 %
Stanley Ivory .... dis. 55 @55&10 %

Steelyards.—Hart's Pattern dis .... 40&10@50 %

Per doz.	$14.50	17.75	21.00	26.50	31.00	35.50
Lbs.	50	100	150	200	250	300

American Pattern .... dis. 40&10@50 %

Per doz.	$8.00	10.25	13.75	15.00	16.75	19.50
Lbs.	50	100	150	200	250	300

Scale Beams .... 60&5@60&10 %
Custers .... 25 %

Squares.
Steel and Iron, dis. 60&10 %; full cases dis .... 70&10@70&10&5 %
Try Squares, Stanley .... dis 60&10 %
Disston's Try Squares .... dis 45&10 %

Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened .... ℔ doz $7.00 net
Clipper No. 10, Bronzed Blade, Boxed and Sharpened .... ℔ doz $6.70 net

Saws.—Disston's Hand, Panel and Rip .... dis 20&10 %
Disston's Circular .... dis 45&10 %
Cross-Cut No. 2, Plain Tooth .... dis 45&10 %
Cross-Cut Patent Tooth .... dis 45&10 %
Cross-Cut Champion Tooth .... dis 45&10 %

Shovels and Spades.
Oliver Ames & Sons, new list .... dis 20 %
Griffiths .... dis 50&10@60 %
Rowland .... dis 60@60&5 %

Sad Irons.—4 to 10 ℔ .... ℔ ℔ 2.35@2.50¢
Mrs. Potts' Patent .... dis 35@40 %

Stone.
Washita Extra .... ℔ ℔ 30¢
Washita No. 1 .... ℔ ℔ 25¢
Washita No. 2 .... ℔ ℔ 20¢
Washita Slips .... ℔ ℔ 50¢
Washita Axe .... ℔ ℔ 15¢
Hindostan Oil Stone No. 1 .... ℔ ℔ 4½ %
Hindostan Axe Stone .... ℔ ℔ 5¢
Hindostan Slips .... ℔ ℔ 8¢

Screws.—Parker list (new list).
Flat Head Iron .... dis 75&10 %
Flat Head Brass .... dis 75 %
Round Head Brass .... dis 70 %
Round Head Iron .... dis 70&10 %

Spoons.
Plated .... dis 50&10@60 %
German Silver .... dis 50 @ 50&5 %
Britannia, Boardman's .... dis 60 %
Britannia, Parker's .... dis 60&10 %
Tinned .... dis 10 %

Springs.—Torrey .... dis 50 %
Gem No. 3 small Japanned .... $2.00 } dis 50&10 %
Gem No. 2 medium Japanned .... 2.75 }
Coil No. 10 ℔ gross net .... $5.50@6.00
Other Standard Springs .... dis 50&10@60 %
Warner Door Springs, ℔ doz. $2.50 .. dis 40&10 @ 50 %
Standard Spring Hinges—
Single No. 0, ℔ doz. net .... $1.10@1.25
Single No. 1, ℔ doz. net .... 1.25@1.50
Other Standard Spring Hinges .... dis 25&10@40 %

Stocks and Dies. .... dis 30 @ 30&10 %

Stove Polish.—Gem .... ℔ gross, $4.50, dis 10 %
Dixon .... 6.00, dis 10 %
Fire Fly .... $3.00 gross, net

Tacks .... Combination discounts
Shoe Nails—4-8, and over, 5½¢ .... } 10 %
Shoe Nails—3½-8, and under 7¢ .... }
Double Pointed Tacks .... dis 80 %

Traps.
Genuine Oneida—Newhouse .... dis 35 %
Im. Oneida—Newhouse list. First qual. dis 60&10&10 %

Vises.—Solid Box. Trenton new list .. dis 50&10@60 %

Wrenches.—Agricultural .... dis 80@80&5 %
Coes' Genuine .... dis 60&3 %
Coes' Mechanics' .... dis 60&10&3 %
Coes' Mechanics,' Mall. Bar .... dis 80 @ 80&5 %

Wire.
Bright or Annealed, No. 0 to 18 .... dis 65&5 %
Bright or Annealed, No. 19 to 26 .... dis 70 %
Bright or Annealed, No. 27 to 36 .... dis 70 %
Coppered, 0 to 18 .... dis 65 %
Tinned Broom Wire .... dis 65 %
Galvanized Barb Wire .... 5¢
Painted Barb Wire .... 4½¢
Galvanized, Nos. 7 to 18 ... Market List, dis .... 60 %

Wringers.
Peerless No. 2½ .... $27.00 }
Peerless No. 2 .... 31.50 }
Universal No. 2½ .... 27.00 }
Universal No. 2 .... 31.50 } dis net @ 5 %
Novelty No. 2, for common tubs .... 27.00 }
Novelty No. 3, " " .... 31.50 }
Excelsior E, for stationary tubs .... 36.00 }
Excelsior F " " .... 43.50 }

PITTSBURGH.

Merchant Iron.

Terms.—Note or acceptance at 60 days, with current rate of exchange on New York, or a discount of 2 ℔ cent. for cash if remitted within 10 days from date of invoice.

For fluctuations and discounts on card rates see weekly Pittsburgh Trade Report.

The following are card rates.

Flat Bar.

1¼ to 4 by ⅜ to 1	2.0¢	1¼ and 1⅛ by ⅜ to ⅝	2.1¢
4½ to 6 by ⅜ to 1	2.1¢	1 and 1⅛ by ⅜ to ⅝	2.2¢
1⅛ to 6 by 1⅛ to 1⅛	2.4¢	⅝, ¾ and ⅞ by ⅜ to ⅝	2.4¢

Rounds and Squares.

1 to 1⅛	2.0¢	4¼ to 5	3.5¢	⅜	2.6¢
2 to 2⅝	2.2¢	⅝ to ⅞	2.1¢	5-16	2.8¢
2¾ to 3¼	2.5¢	⅝ to 9-16	2.2¢	¼	3.0¢
3⅜ to 4	3.0¢	½ to 7-16	2.4¢	3-16	5.0¢

Oval Iron.

¾ to 1⅛	2.4¢	½	2.8¢
⅝ to ⅝	2.6¢	⅜	3.2¢

Half Oval and Half Round.

¾ to 1¼ inch	2.7¢	½ inch	3.5¢
⅝ to ⅝ "	3.2¢	⅜ "	5.0¢

Horse Shoe.

⅝ to 1⅛ by 5-16 to ⅞ inch .... 3.0¢

Wagon Box Iron.

¾ inch, Nos. 13 & 14	3.2¢	⅝ inch, Nos. 11 & 12	3.3¢
⅝ " " 11 & 12	3.0¢	⅝ " " 13 & 14	3.9¢
⅝ " " 13 & 14	3.5¢	⅝ " " 11 & 12	3.6¢

Heavy Bands.

3¼ to 6 by ¼ & 5-16	2.2¢	⅞ to ⅞ by ¼ & 5-16	2.5¢
1⅜ to 3¼ by ¼ & 5-16	2.2¢	⅝ & ¾ by ¼ & 5 16	3.0¢
1 to 1⅜ by ¼ & 5-16	2.3¢		

Light Bands.

1⅛ to 6 by ⅛ to 3-16	2.5¢	¾ & 11-16 by ⅛ to 3-16	3.2¢
1⅛ to 6 by Nos. 11 & 12	2.6¢	¾ & 11-16 by Nos. 11,12	3.3¢
1 to 1⅛ by ⅛ to 3-16	2.6¢	⅝ & 9-16 by ⅛ to 3-16	3.5¢
1 to 1⅛ by Nos. 11 & 12	2.7¢	⅝ & 9-16 by Nos. 11,12	3.6¢
⅞ & 13-16 by ⅛ to 3-16	2.9¢	½ inch by ⅛ & 3-16	3.8¢
⅞ & 13-16 by Nos. 11,12	3.0¢	½ in. by Nos. 11 & 12	3.9¢

Hoop Iron.

1¼ to 4, Nos. 13, 14, 15	2.8¢	¾, Nos. 19 and 20	3.7¢
1¼ to 2, Nos. 16, 17, 18	2.9¢	¾, No. 21	3.8¢
1¼ to 2, No. 19	3.0¢	¾, No. 22	3.9¢
1¼ to 2, No. 20	3.1¢	11-16, Nos. 13, 14 & 15	3.7¢
1¼ to 2, No. 21	3.2¢	11-16, Nos. 16, 17 & 18	3.8¢
1¼ to 2, No. 22	3.3¢	11-16, Nos. 19 and 20	3.9¢
15-16, 1 & 1⅛, Nos. 13, 14 & 15	3.0¢	11-16, No. 21	4.0¢
15-16, 1 & 1⅛, Nos. 16, 17 & 18	3.1¢	11-16, No. 22	4.1¢
15-16, 1 & 1⅛, Nos. 19 & 20	3.2¢	⅝, Nos. 13, 14 and 15	3.9¢
15-16, 1 & 1⅛, No. 21	3.3¢	⅝, Nos. 16, 17 and 18	4.0¢
15-16, 1 & 1⅛, No. 22	3.4¢	⅝, Nos. 19 and 20	4.1¢
⅞, Nos. 13, 14 and 15	3.2¢	⅝, No. 21	4.2¢
⅞, Nos. 16, 17 and 18	3.3¢	⅝, No. 22	4.3¢
⅞, Nos. 19 and 20	3.4¢	⅝, No. 23	4.4¢
⅞, No. 21	3.5¢	9-16, Nos. 13, 14 & 15	4.1¢
⅞, No. 22	3.6¢	9-16, Nos. 16, 17 & 18	4.2¢
13-16, Nos. 13, 14 & 15	3.4¢	9-16, Nos. 19 and 20	4.3¢
13-16, Nos. 16, 17 & 18	3.5¢	9-16, No. 21	4.4¢
13-16, Nos. 19 and 20	3.6¢	9-16, No. 22	4.5¢
13-16, No. 21	3.7¢	9-16, No. 23	4.6¢
13-16, No. 22	3.8¢	½ inch, Nos. 13, 14, 15	4.3¢
¾, Nos. 13, 14 and 15	3.5¢	½ inch, Nos. 16, 17, 18	4.4¢
¾, Nos. 16, 17 and 18	3.6¢	½ inch, Nos. 19 & 20	4.6¢
		½ inch, No. 21	4.7¢
		½ inch, No. 22	4.8¢
		½ inch, No. 23	4.9¢

The prices under Hoop do not apply to Cotton Ties. 1-10¢ ℔ ℔ extra will be charged for each gauge lighter than the lightest indicated.

1-10¢ ℔ ℔ extra will be charged for cutting Hoops to specified lengths.

Barrel Hoops.

1¼ to 2 in., cut to length.
9 to 11 ℔, ℔ set of 6 hoops .... 3.0¢
8 ℔ and less than 9 ℔, ℔ set of 6 hoops .... 3.1¢
Less than — ℔, ℔ set of 6 hoops .... 3.2¢
Extras for cutting to length all preceding Iron, including Tire 1.10

Tank Iron.

No. 9 & heavier, 2.8¢; Plow Slabs, 3.0¢; Plow Wings, 3.3¢

Sheet Iron.

	Common.	Charcoal.	Juniata.
Nos. 10 to 14	3.0¢	4.3¢	6.0¢
Nos. 15 to 17	3.3¢	4.8¢	6.3¢
Nos. 18 to 21	3.6¢	5.1¢	6.6¢
Nos. 22 to 24	3.8¢	5.3¢	6.8¢
Nos. 25 and 26	4.0¢	5.5¢	7.0¢
No. 27	4.2¢	5.7¢	7.2¢
No. 28	4.6¢	6.1¢	7.6¢

All sheets No. 18 and lighter, over 30 inches wide, not less than 2.10¢ extra.

Wood's Patent Planished Sheet.

1st quality (A) .... 10¢ | 2d quality (B) .... 9¢

American Galvanized Sheets.

(Sono C. H. B.) Brand. Patent Leveled:

Nos. 14 to 20	12¢	No. 27	15¢
Nos. 21 to 24	13¢	No. 28	16¢
Nos. 25 and 26	14¢	No. 29	18¢

57½ @ 60 % discount.

Coal Screen Iron.

1⅛ by ⅝ by 5-16 .... 2.5¢ | 1 by ⅝ by 5-16 .... 3.0¢

Angle Iron.

2½, 3, 3½ and 4 inch	2.8¢	1⅛ by 1, for Pl. Hand	3.2¢
1½, 1¾, 2 and 2¼ "	2.8¢	1⅛ by ⅞ " "	3.3¢
1¼ inch	2.9¢	1⅛ by ¾ " "	3.4¢
1 "	3.1¢		

T Rail.

8 ℔ to the yard	2.4¢	20 ℔ to the yard	2.3¢
12 " "	2.3¢	28 " "	2.3¢
16 " "	2.3¢	30 " "	2.3¢

Splice Joints for 12, 16 and 20 ℔ Rail, 30¢ each; 28 and 30 ℔ Rail, 40¢ each: 40 ℔, 50¢ each.
3½ by ⅝ and ½ Spikes for 20 and 28 ℔ Rail .... 3¼¢
2½ and 3 by ⅜ " " 12 and 16 ℔ " .... 3.5¢
2½ by 5-16 " " 8 ℔ Rail .... 4.0¢

Flat Rails.—Punched and Countersunk.

1¼ to 2 by ⅜ to ⅝ inch .... 2.5¢
1⅛ by ⅜ and 7-16 inch .... 2.7¢
1⅛ by ⅜, 7-16 and ½ inch .... 3.0¢

Juniata Nail Rods, 6.0¢; Norway Nail Rods, 7.5¢.
Guard Iron, ¾x⅝x⅝ and ⅞x⅝x⅝ .... 3.5¢
Guard Iron ⅝x⅝x9-16 and ⅝x⅝x¼ .... 3.7¢
Drag Bars .... 2.8¢ | Cyl. & Landside Iron .. 2.7¢
Dropper Bars .... 3.3¢ | Plow Beam Iron .... 2.5¢

Nails.

See Pittsburgh Trade Report.

Tool Steel.

Classification Adopted April 13, 1886, Steel Association of United States.

ROUND, SQUARE AND OCTAGON.

⅝ to 2 .. base,	8.0¢	6⅛ to 7	3.0¢	¼ & 9-32	3.0¢
2⅛ to 3 .. ext.	1.0¢	7⅛ to 8	3.5¢	3-16	5.0¢
3⅛ to 4	1.5¢	9-16 to ½	0.5¢	5-32	10.0¢
4⅛ to 5	2.0¢	7-16 to ⅜	1.0¢	⅛	18.0¢
5⅛ to 6	2.5¢	5-16 and 11-32	2.0¢		

FLATS.

2 to 9-16 inches wide x ⅜ to ⅝ inches thick ... base, 8.0¢

List of Extras.

8 x 7	3.5¢	6 x ⅝	1.0¢	⅝ x 7-16	1.0¢
8 x 6	2.5¢	6 x ¼	1.0¢	⅝ x ⅜	1.0¢
8 x 5	2.5¢	6 x ⅛	2.0¢	⅝ x 5-16	1.5¢
8 x 4	2.0¢	5 x 4	1.5¢	⅝ x ¼	1.5¢
8 x 3	1.5¢	5 x 3	1.0¢	⅝ x 3-16	2.0¢
8 x 2	1.5¢	5 x 2 to ⅝	1.0¢	⅝ x ⅛	2.0¢
8 x 1⅞ to ⅝	1.0¢	5 x ½	1.0¢	½ x 7-16	1.0¢
8 x ½	1.0¢	5 x ¼	1.0¢	½ x ⅜	1.0¢
8 x ¼	2.0¢	5 x ⅛	2.0¢	½ x 5-16	1.5¢
8 x ⅛	3.0¢	4 x 3	1.0¢	½ x ¼	1.5¢
7 x 6	2.5¢	4 x 2 to ⅝	1.0¢	½ x 3-16	2.0¢
7 x 5	2.0¢	4 x ½	1.0¢	½ x ⅛	3.0¢
7 x 4	2.0¢	4 x ¼	1.0¢	⅜ x 5-16	1.5¢
7 x 3	1.5¢	4 x ⅛	2.0¢	⅜ x ¼	2.0¢
7 x 2 to ⅝	1.0¢	3 x 3 to ⅝	1.0¢	⅜ x 3-16	3.0¢
7 x ½	1.0¢	3 x ½	1.0¢	⅜ x ⅛	4.0¢
7 x ¼	1.0¢	3 x ¼	1.0¢	5-16 x ¼	2.0¢
7 x ⅛	2.0¢	3 x ⅛	2.0¢	5-16 x 3-16	4.0¢
6 x 5	2.0¢	2 to ⅝ x ½	1.0¢	5-16 x ⅛	8.0¢
6 x 4	1.5¢	2 to ⅝ x ¼	1.5¢	¼ x 3-16	5.0¢
6 x 3	1.5¢	2 to ⅝ x ⅛	2.0¢	¼ x ⅛	15.0¢
6 x 2 to ⅝	1.0¢	⅝ x ½	1.0¢	3-16 x ⅛	20.0¢

All unenumerated sizes will be charged at price of next larger dimension in list. Cutting to multiples or specified lengths, ½¢ ℔ ℔ for over 24-inch; under, according to contract.

Crucible Steels.

CRUCIBLE MACHINERY, ROUNDS AND SQUARES.

¾ to 3 inches .... base, 4.0¢	⅜ to 7-16 in ..... extra, 0.5¢
3⅛ to 4 in ...... extra, 0.5¢	5-16 and 11-32 in .. ex., 1.0¢
4⅛ to 5 in ...... extra, 1.0¢	¼ and 9-32 ...... extra, 1.5¢
5⅛ to 6 in ..... extra, 1.5¢	3-16 inch .... extra, 3.0¢
½ to 11-16 in ... extra, 0.2¢	

Octagons, ½¢ extra throughout the list. Flats, one-half the extras of the Flat Tool Steel classification. Cutting to multiples or specified lengths, 1½¢ per pound for anything over 24 inches long. For lengths 24 inches or less, according to to special contract.

CRUCIBLE SPRING STEEL, FLAT.

1¼ to 4 in. x No. 4 gauge to ¼ in. inc .... base, 4.0¢
1 and 1⅛ in. x No. 1 gauge to 4 gauge inc ... extra, 0.2¢
1 to 3 in. x No. 5 gauge to 7 gauge inc .... extra, 0.5¢
⅞ to 3 in. x No. 8 gauge to 10 gauge inc ..... extra, 1.0¢
¾ to 3 in. x No. 11 gauge to 16 gauge inc .... extra, 2.0¢
¾ to 3 in. x No. 17 gauge to 20 gauge inc .... extra, 3.5¢
⅜ to ⅝ in. x No. 10 gauge to 16 gauge inc ... extra, 4.0¢
⅜ to ⅝ in. x No. 17 gauge to 20 gauge inc ... extra, 5.0¢
⅜ to ⅝ in. x No. 21 gauge to 24 gauge inc ... extra, 6.0¢
Cut to length, 24 inches and over, ¼¢ per pound extra and under, according to special contract.

ROUND AND SQUARE CRUCIBLE SPRING STEEL.

⅝ to 1⅛ inches .. base, 4.0¢	5-16 in .... extra, 1.0¢
½ to 9-16 in ..... extra, 0.2¢	¼ in .... extra, 1.5¢
⅜ to 7-16 in ..... extra, 0.5¢	

CRUCIBLE SHEET STEEL, ALL GRADES.

To 21 gauge (for best quality), base, 9.0¢; 22 gauge, extra, 1.0¢; and 1¢ advance of extra for every No. of gauge to No. 26.

CRUCIBLE CIRCULARS.

Diameter.		Diameter.	
To 46 inch .... base,	11¢	56 to 60 inch .. extra,	5¢
48 inch ..... extra,	1¢	62 to 64 inch .. extra,	7¢
50 inch ..... extra,	2¢	66 to 70 inch .. extra,	9¢
52 to 54 inch .. extra,	3¢	72 inch ..... extra,	11¢

Bessemer and Open-Hearth Steels.

MACHINERY ROUNDS AND SQUARES.

¾ to 3 in. inc ..... base, 2.8¢	½ to 11-16 inch inc .... 0.2¢
Extra.	⅜ to 7-16 inch inc ..... 0.3¢
3⅛ to 4 inches inc ..... 0.3¢	5-16 and 11-32 in. inc .. 0.5¢
4⅛ to 5 inches inc ..... 0.5¢	¼ and 9-32 inch inc .... 0.7¢
5⅛ to 6 inches inc ..... 1.0¢	

Machine cutting to specified lengths above 24 in .. 0.2¢
Machine cutting to specified lengths, 12 to 24 in ... 0.4¢
Machine cutting to specified lengths, less than 12 in., according to contract, but not less than 0.6¢ extra on each size. Shearing or sawing, one-half of the above extras for cutting.

MACHINERY FLATS.

1¼ in. and wider x ⅜ to 1 in. thick .... base, 2.8¢
1¼ in. and wider x ¼ to 5-16 in. thick .... extra, 0.1¢
1¼ in. and wider x 3-16 and 7-32 in. thick ... extra, 0.2¢
1¼ in. and wider x ⅛ and 5-32 in. thick ..... extra, 0.3¢
¾ in. to 1⅛ in. x ¼ to 1 in. thick .... extra, 0.2¢
¾ in. to 1⅛ in. x 3-16 and 7-32 in. thick .... extra, 0.3¢
¾ in. to 1⅛ in. x ⅛ and 5-32 in. thick ...... extra, 0.5¢
⅜ in. to ⅝ in. x ¼ to ½ in. thick .... extra, 0.3¢
⅜ in. to ⅝ in. x 3-16 and 7-32 in. thick ..... extra, 0.5¢
⅜ in. to ⅝ in. x ⅛ and 5-32 in. thick ..... extra, 0.7¢
⅜ in. to 1⅛ in. x 1-16 and 3-32 in. thick .... extra, 2.0¢
1¼ in. to 3 in. x 1-16 and 3-32 in. thick ..... extra, 1.0¢

TIRE STEEL, ROUND EDGES.

¾ inch and wider x ⅜ to 1 inch thick .... base, 2.6¢
Extras same as Flat Machinery extras.

TIRE STEEL, SQUARE EDGES.

Throughout the list 0.2¢ more than for same sizes of Round Edge Tire.

TOE-CALK STEEL.

1¼ inches and wider x ⅜ to 1 inch thick .... base, 2.7¢
Extras same as Machinery Extras

SLEIGH-SHOE STEEL.

1¼ inches and wider x ⅜ to 1 inch thick ..... base, 2.8¢
Extras same as Machinery Extras.

SPRING STEEL FLAT.

1¼ to 4 in. x No. 4 gauge to ¼ in. inc. .... base, 2.9¢
1 and 1⅛ in. x No. 1 gauge to 4 gauge inc ... extra, 0.2¢
1 to 3 in. x No. 5 gauge to 7 gauge inc ..... extra, 0.5¢
⅞ to 3 in. x No. 8 gauge to 10 gauge inc ..... extra, 1.0¢
¾ to 3 in. x No. 11 gauge to 16 gauge inc .... extra, 2.0¢
¾ to 3 in. x No. 17 gauge to 20 gauge inc .... extra, 3.5¢
⅜ to ⅝ in. x No. 10 gauge to 16 gauge inc ... extra, 4.0¢
⅜ to ⅝ in. x No. 17 gauge to 20 gauge inc .. extra, 5.0¢
⅜ to ⅝ in. x No. 21 gauge to 24 gauge inc ... extra, 6.0¢
Bessemer and Open-Hearth cut to length, 24 inches and over, 0.1¢ per pound extra; and under, by special contract.

ROUND SPRING STEEL.

⅝ to 1⅛ inches .. base, 2.9¢	5-16 inch .... extra, 1.0¢
½ to 9-16 in ..... extra, 0.2¢	¼ inch .... extra, 1.5¢
⅜ to 7-16 in ..... extra, 0.5¢	

CUTLERY STEEL.

14 gauge thick and heavier .... base, 3¢
15, 16 and 17 gauge .... extra, 1¢
18 and 19 gauge .... extra, 2¢
Rounds, ⅝ diameter and heavier .... base, —¢
Rounds, smaller sizes, extras same as Machinery.
Double bevel, 14 gauge and heavier .... —¢
Double bevel, thinner than 14 gauge .... extra, 1¢
Fork Steel, Open-Hearth or Bessemer .... 3¢
Rake Steel, Open-Hearth or Bessemer .... 4¢
Hoe Steel, Open-Hearth or Bessemer .... 3¢
Auger Bit Steel, Open-Hearth or Bessemer .... 3¢
Plow Slabs, Open-Hearth or Bessemer .... 3¢
Ovals and Half Ovals, Half Rounds and Special Shapes subject to special agreement.
No freight allowance shall be made on less than 500 pounds of Steel in one shipment.

MISCELLANEOUS.

Axle Billets .... 2 ¢	Thrasher Steel .... 2½¢
Scythe Back Steel .... 3 ¢	Thrasher Teeth .... 3½¢
Grain Drill Bars ...... 2½¢	Rolled Ham'r Billets .. 2½¢
Grain Drill Points .... 3½¢	

Cutter Shoe, cut to lengths and tapered .... 3¢
Rolling Coulter Blanks, cut and punched .... 6¢
Terms.—Four months: 3 per cent. discount for cash if remitted within 30 days.

Plate Steel.

Shell Steel, ¼ inch thick and heavier, 50,000 to 60,000 pounds tensile strength .... base, 3.25¢
Shell Steel, 3-16 inch thick, 50,000 to 60,000 pounds tensile strength .... extra, 0.3¢
Shell Steel, 8 gauge and 9 gauge thick, 50,000 to 60,000 pounds tensile strength .... extra, 0.5¢
Shell Steel, 10 gauge to 12 gauge thick, 50,000 to 60,000 pounds tensile strength .... extra, 0.7¢
Shell Steel Plates, 90 inches to 100 inches wide, extra on each thickness, ¼¢
Shell Steel Plates, 100 inches to 105 inches wide, extra on each thickness, ½¢
Shell Steel Heads, 95 inches diameter to 105 inches diameter .... extra on each thickness, ½¢
Shell Steel Heads, 105 inches diameter to 108 inches diameter .... extra on each thickness, 1.0¢
Flange Steel, ¼ inch thick and heavier, 50,000 to 60,000 pounds tensile strength .... extra, 0.5¢
Flange Steel, 3-16 inch thick, 50,000 to 60,000 pounds tensile strength .... extra, 0.8¢
Flange Steel, 8 gauge and 9 gauge thick, 50,000 to 60,000 pounds tensile strength .... extra, 1¢
Flange Steel, 10 gauge to 12 gauge thick, 50,000 to 60,000 pounds tensile strength .... extra, 1.2¢
Flange Steel Plates, 90 inches to 100 inches wide, extra on each thickness, ½¢
Flange Steel Plates, 100 inches to 105 inches wide, extra on each thickness, ½¢
Flange Steel Heads, 95 inches diameter to 105 inches diameter .... extra on each thickness, ½¢
Flange Steel Heads, 105 inches diameter to 108 inches diameter .... extra on each thickness, 1¢
Best Boiler Steel, ¼ inch thick and heavier, 50,000 to 70,000 pounds tensile strength .... extra, 1¢
Best Boiler Steel, 3-16 inch thick, 50,000 to 70,000 pounds tensile strength .... extra, 1.3¢
Best Boiler Steel, 8 gauge and 9 gauge thick, 50,000 to 70,000 pounds tensile strength .... extra, 1.5¢
Best Boiler Steel, 10 gauge to 12 gauge thick, 50,000 to 70,000 pounds tensile strength .... extra, 1.7¢
Best Boiler Steel Plates, 90 inches to 100 inches wide, extra on each thickness, ½¢
Best Boiler Steel Plates, 100 inches to 105 inches wide .... extra on each thickness, ½¢
Best Boiler Steel Heads, 95 inches diameter to 105 inches diameter .... extra on each thickness, ½
Best Boiler Steel Heads, 105 inches diameter to 108 inches diameter .... extra on each thickness, 1¢

Heads, when not in complete Boiler sets, to be ¼¢ per pound extra on each above grade, thickness and size. No Steel to be sold as Marine Boiler Steel except Best Boiler grade. Tank Steel, not stamped, ½¢ per pound less than Shell Steel, subject to same classification.

Miscellaneous Cast Steel.

Auger and Auger Bit .... 3¢	Roller .... 5½¢
Axle Steel for carriages and wagons .... 3¢	Spindle, subject to Machin'y classification .. 5½¢
Frog Points & Plates .. 5½¢	Trap Spring Steel .... 6¢
Frog Side Bars .... 5¢	Forged Crank Pins and Lathe Spindles ...... 7½¢
Pick, plain (hammered) .. 5¢	Piston Rods, plain .... 4¢
Pick and Mattock, beveled (rolled) .... 3¢	Piston Rods, forged to shapes .... 7½¢
Skate Steel .... 4½¢	Slide Bars, plain .... 5¢
Pike and Cant Hook .... 7¢	Do., forged to shapes ... 7½
Coal & Granite Wedge .. 7¢	

FILE CAST STEEL.

Square, Round, Half Rnd and Flat Bastard, 8 in. and over .... 5¢	Mill Saw, 8-in. and over .. 5¢
	Taper, 3½-in. and over .. 6¢
	Horse and Shoe Rasp .... 5¢

SPRING CAST STEEL.

Spiral, Taper, cut to lengths .... 5½¢
Solid Safe Cast Steel .... 4¢
Three and Five Ply Cast Steel .... 5¢

AGRICULTURAL IMPLEMENT CAST STEEL.

Fork & Rake, Crucible .. 4¢	Corn Stalk Cutter, bev .. 4¢
Horse Rake Steel, cut to lengths, Crucible .... 5¢	beveled Hoe and Shovel Steel in Bars .... 4½¢
Hoe, Crucible .... 5¢	Cruc. Plow St'l in Slabs .. 4¢

Rolls and Castings.

Per lb.
Furnace and Floor Plates .... 1¾¢
Sand Rolls over 12 inches diameter .... 2¼¢
Sand Rolls 12 inches diameter and under .... 2¾¢
Roll Pinions over 12 inches diameter .... 2½¢
Roll Pinions 12 inches diameter and under .... 3 ¢
Housen and Rolling Mill Castings not otherwise specified .... 2¼¢
Spindles and Coupling Boxes .... 2 ¢
Squeezer Castings .... 2¼¢
Squeezer Pinions and Wheels .... 2½¢
Guide Plates .... 2½¢
Spur and Bevel Wheels, large .... 3 ¢
Spur and Bevel Wheels, small .... 3½¢
Pulleys, up to 30 inches .... 4 ¢
Pulleys, over 30 inches .... 3½¢
Engine Castings, light .... 4 ¢
Engine Castings, heavy .... 3½¢

White and Red Lead.

Strictly Pure White Lead in Oil, in Kegs. In lots of 500 ℔ and upward, 7¢ ℔ ℔; in lots less than 500 ℔, 7½¢ ℔ ℔ net; in 25-℔ cans, packed in 100-℔ cases, ½¢, and 12½-℔ cans, 1¢, over keg price; in 1 to 5 ℔ cans, assorted, in 100-℔ cases, 2½¢ over keg price.
Strictly Pure Dry White Lead in kegs, ℔ ℔ .... 7 ¢
Strictly Pure Red *extra bright and fine*, in kegs ... 7 ¢
Strictly Pure Litharge, *powdered, ext. fine*, in kegs .. 7 ¢
Orange Mineral, *True*, in barrels, net 6 days and not subject either to rebate or freight equalization .... 8¾¢
Orange Mineral, *True*, in 100-℔ kegs, net 60 days and not subject either to rebate or freight equalization .... 9 ¢
Terms: Note or acceptance at 60 days; or less 2½ % for cash if paid within 15 days from date of invoice on lots of 500 ℔ and over.
Freight equalized with all points where White Lead is made.

Window Glass.

Discount, 75 % *Single Strength*; 75 & 10 % *Double*. Prices current, ℔ box of 50 feet.

Single Strength.

United Inches	Sizes.	AA.	A.	B.	C.
25	6 x 8 to 10 x 15	$8.75	$8.00	$7.50	$7.00
39	11 x 14 to 15 x 24	9.25	8.50	8.00	7.25
48	16 x 24 to 20 x 28	10.75	9.75	8.75	7.75
54	15 x 34 to 24 x 30	12.25	10.75	9.00	....
60	26 x 28 to 24 x 36	13.00	11.50	9.75	....
70	26 x 36 to 26 x 44	14.50	13.25	10.75	....
80	26 x 46 to 30 x 50	15.00	14.00	11.25	....
84	30 x 52 to 30 x 54	....	....	....	....
90	30 x 56 to 34 x 56	....	....	....	....
94	34 x 58 to 34 x 60	....	....	....	....
100	36 x 60 to 40 x 60	....	....	....	....
	Double Strength.				
25	6 x 8 to 10 x 15	13.25	12.25	11.25	10.5
30	11 x 14 to 15 x 24	14.50	13.25	12.50	11.2
48	16 x 24 to 20 x 28	17.25	15.75	14.00	....
54	15 x 34 to 24 x 30	19.75	17.25	14.50	....
60	26 x 28 to 24 x 36	21.00	18.50	15.75	....
70	26 x 36 to 26 x 44	23.25	21.25	17.25	....
80	26 x 46 to 30 x 50	24.00	22.50	18.00	....
84	30 x 52 to 30 x 54	25.75	23.25	19.25	....
90	30 x 56 to 34 x 56	27.75	25.00	21.75	....
94	35 x 58 to 34 x 60	29.25	27.75	24.00	....
100	36 x 60 to 40 x 60	33.25	30.00	27.75	....

Sizes above — $10 ℔ box extra for every 5 inches.
An additional 10 per cent. will be charged for all glass more than 40 inches wide. All sizes above 52 inches in length, and not making more than 81 united inches, will be charged in the 84 united inches bracket.

Hubbard, & Co.'s Goods.

Axes, Single Bit, Lippincott .... per doz., $7.00
Axes, Single Bit, James & Co .... per doz., 6.50
Axes, Double Bit, Lippincott .... per doz., $12.00
Axes, Double Bit, James & Co .... per doz., 10.00
Drain Tools, list .... dis 20&7½&5 %
Hoes, Planters' and Scovill Pattern .... dis 60 %
Hoes, Handled, Square Eye, German .... dis 60 %
Handles, Cross Cut .... per doz., $2.25
Handles, Shovel, Bent, Bored, Riveted .. per doz., 2.00
Saws, Circular .... dis 50 %
Saws, Long .... dis 45 %
Saws, Cross-Cut, H. B. & Co., Champion, foot net .. $0.27
Saws, Cross-Cut, Lippincott, Champion, foot net .. $0.25
Shovels, list .... dis 20&7½&5 %
Spades, list .... dis 20&7½&5 %
Scoops, list .... dis 20&7½&5 %

BOSTON.

Reported by Bigelow & Dowse.

Ammunition.
Cartridges—
Rim Fire Cartridges ..... dis 60 %
Rim Fire Military Cartridges ..... dis 15 %
Cen. Fire Cartridges, Pistol and Rifle ..... dis 40 %
Cen. Fire Cartridges, Military and Sporting ..... dis 30 %
Blank Cartridges, except 22 and 32 cal., an additional 10 % over above discounts.
Blank Cartridges, 22 cal $1.50
Blank Cartridges, 32 cal 3.00
Primed Shells and Bullets ..... dis 25 %
B. B. Caps, Round Ball $1.60
B. B. Caps, Conical Ball, Swaged 1.75
Primers—
Berdan Primers, all sizes, and B. L. Caps (for Sturtevant Shells) ..... 90¢
All other Primers, all sizes $1.10
Shells—
Paper Shot Shells, 1st and 2d or S. G. qual ..... dis 25&5 %
Paper Shot Shells, Club, Rival, Climax ..... dis 40&5 %
Paper Shot Shells, Star Brand ..... dis 50&5 %
Brass Shot Shells, first quality ..... dis 60 %
Brass Shot Shells, Club, Rival and Climax ..... dis 65 %
Wads—
U. M. C. & W. R. A.—B. E., 11 up $2.00
U. M. C. & W. R. A.—B. E., 9&10 ..... 2.30
U. M. C. & W. R. A.—B. E., 7&8 ..... 2.60
U. M. C. & W. R. A.—P. E., 11 up 3.10
U. M. C. & W. R. A.—P. E., 9&10 ..... 4.00
U. M. C. & W. R. A.—P. E., 7&8 ..... 4.90
} dis 20 %

Anvil & Vise.

	10	20	30	40	
Cheney	$3.50	4.50	5.50	6.50	dis 25 %

Eagle, Fisher & Norris, No. 00, $1.75; 0, $2.25; 1, $2.75; 2, $3.25; 3, $4.00; 4, $4.50; 5, $5.25; 6, $6.00; 7, $6.50; 8, $7.25; 9, $8.25.
100 ℔ and over 10¢ ℔ ..... dis. 20 %

Augers & Bitts.
L'Hommedieu's Ship Auger ..... dis 15 %
Jenning's Bitts ..... dis 25 %
Cook's Bitts ..... dis 50&10 %
Griswold's Bitts ..... dis 60&10&5 %
Lewis's Patent Bitts ..... dis 40 %
Jennings' Pattern ..... dis 50&10&5 %

Awning Fixtures.
Dearborn's No. 1 ..... ℔ doz $10.50
Dearborn's No. 2 ..... ℔ doz 10.50 } dis 35 %
Dearborn's No. 3 ..... ℔ doz 13.50

Axes.
Blue Jackets ..... ℔ doz $7.00
Francis Axe Co ..... ℔ doz 7.00
Romer Bros ..... ℔ doz 6.50
Romer Bros., Polished Steel ..... ℔ doz 8.00

Axle Grease.
Belknap's tin boxes ..... ℔ doz $2.00
Belknap's 5 ℔ pails ..... ℔ doz 7.00
Belknap's 10 ℔ pails ..... ℔ doz 12.00
Belknap's 50 ℔ cans ..... ℔ ℔ .10

Ax Handles.
Oak Extra, 31 in., No. A ..... ℔ doz $2.50
Oak Extra, 34 in., No. A ..... ℔ doz 2.50
Oak Extra, 31 in., No. B ..... ℔ doz 2.00
Oak Extra, 34 in., No. B ..... ℔ doz 2.00
Oak Extra, 31 or 34 in., No. C ..... ℔ doz 1.40

Balances.—Chatillon's ..... dis 40&10 %

Barn Door Rail.
Cast Angle (for Anti-Friction Hangers) ..... ℔ ft., 2¢
Cast Half Round ..... ℔ ft., ⅝, 2½¢; ¾, 3¢
Wrought Round ..... ℔ ft., ½, 2½¢; ⅝, 3¢; ¾, 4¢

Bird Cages.
Hendry's Japanned ..... dis 40&10 %
Hendry's Brass ..... dis 33⅓&10 %

Blind Fasts.
No. 6 Fasts ..... ℔ C sets 6.00
Shedd's ..... ℔ C sets 6.00

Blind Hinges.—Mall. Hook, 3 holes ..... ℔ C sets 7.00

Blocks.—Tackle ..... dis 50 %

Bolts.
Carriage.
Com. list June 10, 1884 ..... dis 75&10 %
Genuine Eagle, list October, 1884 ..... dis 75 %
Tire.
Common, list February 28, 1883 ..... dis 65&10 %

Borax.—Refined ..... ℔ ℔ 10¢

Boring Machines.
Eagle Upright, each ..... $5.50 list } dis 50
Eagle Angle, each ..... 6.75 list } & 10 %

Braces.
Barber's ..... dis 50 %
Spofford's ..... dis 50&10 %

Brackets.
Rich Bros. Bronzed Shelf ..... dis 50&10 %
Rich Bros. Store Shelf ..... dis 40&10 %

Bright Wire Goods.
Regular list ..... dis 80 %

Butts.—Union Fast Joint ..... dis 60&10 %
Union Loose Joint ..... dis 70&10 %
Union Japanned Acorn ..... dis 70&10 %
Union Silvered Acorn ..... dis 70&10 %
Union Boston Finish ..... dis 80 %
Union Spiral Spring ..... dis 40 %
Wrought Brass ..... dis 75&10 %

Carriage Bolts.—Eagle Norway ..... dis 75 %
Common, new list ..... dis 70&10 %

Cards.
Watson's make Horse & Curry ..... dis 10 % } Rev. List.
Watson's Cotton ..... dis 10 % } Aug., 1883.
Watson's Wool ..... dis 10 %

Carpet Sweepers.
Welcome Rubber Roll ..... ℔ doz $19.00
Welcome Cog Wheel ..... ℔ doz 17.00

Casters.—Bed and Table ..... dis 50&10 %

Chain.
Coil 3-16 ..... ℔ ℔ 8¢
Coil ¼ ..... ℔ ℔ 6¢
Coil 5-16 ..... ℔ ℔ 5¢
Coil ⅜ ..... ℔ ℔ 5¢
Coil 7-16 ..... ℔ ℔ 4½¢
Coil ½ ..... ℔ ℔ 4½¢

Chalk.—White, Carpenter's ..... ℔ gross 55¢
Red, Carpenter's ..... ℔ gross 75¢
Blue, Carpenter's ..... ℔ gross 90¢
Crayons ..... 12¢

Chisels.—Peck, Stow & Wilcox ..... dis 70&10&10 %
Underhill, Framing ..... dis 40 %
Buck's Chisels ..... dis 30 %

Coal Hods.—Galv'd, New List ..... dis 60&10&10 %
Japanned, New List ..... dis 60&10&10 %

Cocks, Brass.
Racking ..... } dis 55&10 %
Globe ..... }
Plain Bibbs ..... }
Compression, Eastern Mfg. Co.:

	¼	⅜
To Screw ..... ℔ doz	$2.10	2.30
To Solder ..... ℔ doz	2.50	2.50

Coffee Mills.—New List ..... dis 45&10 %

Copper Rivets ..... dis 50&10 %

Cordage.
Manila, usual trade dis 1¢ ℔ ℔ ..... ℔ ℔ 13¢
Sisal, usual trade dis 1¢ ℔ ℔ ..... ℔ ℔ 9¢

Cow Ties ..... dis 50&10 %
No. 30 6 ft. No. 6 Wire, with toggle ..... ℔ doz $3.80
No. 35, 3 ft. No. 6 Wire, with snap ..... ℔ doz 4.00
No. 40, 3¼ ft. No. 6 Wire, with toggle ..... ℔ doz 4.30
No. 45, 3¼ ft. No. 6 Wire, with snap ..... ℔ doz 4.50
No. 50, 4 ft. No. 4 Wire, with toggle ..... ℔ doz 4.75
No. 55, 4 ft. No. 4 Wire, with snap ..... ℔ doz 5.00
No. 60, 4¼ ft. No. 3 Wire, with toggle ..... ℔ doz 5.00
No. 65, 4¼ ft. No. 3 Wire, with snap ..... ℔ doz 5.50

Crow Bars.—Cast Steel ..... ℔ ℔ 5¢

Cutlery.
Pocket American Shear Co.'s ..... net
Pocket Eastern Shear Co.'s ..... net
Butcher Knives, Wood's, Lap Bolster, Square Handle ..... dis 40 %
Steak Knives ..... dis 40 %
Lap Bolster, Oval Handle ..... dis 40 %
Sticking ..... dis 40 %
Skinning ..... dis 40 %
Butcher, Common Round Handle, Wood's ..... dis 40 %
Shoe Knives, Wood's ..... dis 30 %

Dog Collars.
Embossed Gilt, Pope & Stevens' list } dis 40 %
Leather, Pope & Stevens' list }
Brass, Pope & Stevens' list }

Door Springs.—Torrey's Rod ..... ℔ doz $1.50
Gem Coil, new list ..... dis 20 %
Crown ..... ℔ doz $1.00
Warner's ..... ℔ doz 1.50

Drawing Knives.
Kimball's Solid Steel ..... ℔ inch 7½¢
Eastern Mfg. Co.'s Solid Steel ..... ℔ inch 7½¢ dis 20 %

Drills.—Morse Twist Drill Co.'s.
Bit stock Drills } dis 50 %
Wire Gauge Drills }
Jobbers' and Letter Drills }

Drill Chucks.
Morse's Beach Patent ..... each $8, dis 20 %
Morse's Adjustable ..... each $7, dis 20 %

Emery.

	No. 4 to 46 gr.	No. 54 to 150 gr.	Flour, CF, F, FF.
Kegs, ℔ ℔	4 ¢	4 ¢	2½¢
½ kegs, ℔ ℔	4½¢	4½¢	2¾¢
¼ kegs, ℔ ℔	4¾¢	5 ¢	3¼¢
10 ℔ cans, ℔ ℔	7 ¢	7 ¢	5 ¢

Enameled Ware.
Enameled Kettles ..... dis 50 %
Enameled Sauce Pans ..... dis 25 %

Files.
American File Co ..... dis 60 %
Nicholson File Co ..... dis 60 %

Fly Traps.
Paragon ..... ℔ doz $2.00
Balloon ..... ℔ doz 1.75

Forks.
Withington & Cooley Mfg. Co.'s ..... dis 60&10 %

Freezers.
Packer's ..... dis 60 %
Gouche's ..... dis 60 %

Grub Hoes.
Iron City Tool Co.'s ..... dis 60 %

Hammers.
Maydole's ..... dis 25 %
C. Hammond's ..... dis 40 %

Hangers.
Common Hangers ..... dis 50&10 %
Common Rollers ..... dis 50&10 %
Faultless Hangers ..... dis 40 %
Victor Hangers ..... dis 50 %
American Parlor Door, $6 set ..... dis 20&10 %

Hatchets.—C. F. Dowse, new list ..... dis 40 %
Underhill ..... dis 40 %
Eastern Tool Co.'s ..... net

Hay Knives.—Lightning ..... $18.00, dis 10 %

Hinges.—Strap and T (new list) ..... dis 65 %
Providence Plate ..... ℔ ℔ 5¢
Wrought Screw Hook ..... ℔ ℔ 5¢

Hoes.—W. & C. Mfg. Co.'s ..... dis 60&10 %

Hooks and Staples.—Brewer's (new list) ..... dis 70 %

Horse Nails.

	No. 6	7	8	9	
Putnam Pointed	$0.24	.22	.21	.20	.5&7 %
Bridgewater	.23	.21	.20	19	.30 %

Knobs ..... dis 45 %

Lanterns.—Tubulars, No. 0 ..... ℔ doz $7 0

Lawn Mowers.
Continental ..... dis 5 &5 %
Quaker City ..... dis 50&5 %
Philadelphia Keystone ..... dis 50&5 %

Lead.—Sheet ..... ℔ ℔ 8¢
Pipe ..... ℔ ℔ 7¢

Locks.—Norwalk ..... dis 45 %
Eagle Cabinet ..... dis 40 %
Eagle Trunk ..... dis 15 %
Mallory, Wheeler & Co. ..... dis 6⅔&5 %

Manure Forks.—W. C. & Co ..... dis 60&10 %

Mattocks.
Long Cutter, $16.00 ℔ doz } dis 60 %
Short Cutter, $15.50 ℔ doz }
Pick Cutter, $16.00 ℔ doz }

Measuring Tapes.—Eddy's ..... dis 20 %

Meat Cutters.
Enterprise ..... dis 30

Nos.	10	12	22	32	42
Each	$3.00	2.50	4.00	6.00	10.00

Nails. ..... ℔ keg $2.35
Wire Nails, list April 13, 1886 ..... dis 50&5 @ 50&10 %
Wire Carpet Nails ..... dis 60 %

Oilers.—Zinc and Tin ..... dis 60 %
Brass and Copper ..... dis 50 %
Draper's Common, ℔ doz., $3.75; Patent, ℔ doz $4.50
Thompson's ..... ℔ doz $3.00
Malleable Iron ..... dis 10 %

Ox Bows.—Extra finished and varnished ..... dis 15 %
1¼ in., ℔ doz. pair ... $7 00 | 2 in., ℔ doz. pair .. $10.00
1⅝ in., ℔ dos. pair ... 9.00 | 2¼ in., ℔ doz. pair .. 12.00

Paper.—Common Tarred Sheathing ..... ℔ ℔ 1¾¢
Eagle Brand Tarred Sheathing ..... ℔ ℔ 2 ¢
Common, Dry Sheathing ..... ℔ ℔ 1¾¢
Eagle Brand Dry Sheathing ..... ℔ ℔ 2½¢
Neponset Water Proof ..... ℔ ℔ 3½¢

Picks.
I. C. T. W., Adze Eye, 6 to 7 ℔ $13.00 ..... dis 60 %

Planes.
Auburn Tool Co., Bench ..... dis 20 %
Auburn Tool Co., Fancy ..... dis 15 %
Auburn Tool Co., English Iron ..... dis 15 %
N. Y. Tool Co., Bench ..... dis 25 %

Plated Ware.—Rogers & Bro ..... dis 50&10 %

Pliers.—Vom Cleff & Co.'s ..... net list
Button's Wire Pliers ..... dis 33⅓ %

Plumb & Levels.—Stanley R. & L. Co ..... dis 70&10 %

Potato Diggers.
W. C. & Co., reduced list ..... dis 60&10 %

Pulleys.—Acme or Excelsior, 1¾ in ..... ℔ doz 22¢
Acme or Excelsior, 2 in ..... ℔ doz 24¢

Pumps.—Union Manufacturing Co.
Iron Cistern ..... dis 50 %
Iron Pitcher Spout ..... dis 60 %
Copper ..... dis 30 %

Rivets.—In 5 ℔ papers ..... dis 45 %
Burrs ..... dis 50 %
Copper ..... dis 60 %

Razors.
Genuine Swedish ..... ℔ doz $13.50

Rope.—Manufacturers' list, February 6, 1886.
Manila ..... ½ inch and larger ℔ ℔ 13 ¢
Manila ..... ⅜ inch ℔ ℔ 13½¢
Manila ..... ¾ and 5-16 inch ℔ ℔ 14 ¢
Manila, Tarred Rope ..... ℔ ℔ 12 ¢
Manila, Hay Rope ..... ℔ ℔ 13 ¢
Sisal ..... ½ inch and larger ℔ ℔ 9 ¢
Sisal ..... ⅜ inch ℔ ℔ 9½¢
Sisal ..... ¾ and 5-16 inch ℔ ℔ 10 ¢
Sisal, Hay Rope ..... ℔ ℔ 9 ¢
Sisal, Tarred Rope ..... ℔ ℔ 8½¢
Sisal, Single Ply Lath Yarn ..... ℔ ℔ 8 ¢
Cotton Rope ..... ℔ ℔ 15@18¢ net
Jute Rope ..... ℔ ℔ 7¢
} Dis 16⅔¢ ℔ m

Rules.—Stanley, Boxwood ..... dis 75&10 %
Stanley, Ivory ..... dis 60&10 %

Sad Irons.—Common ..... ℔ ℔ 3 ¢
Laundry ..... ℔ ℔ 6½¢
Tailors' Geese ..... ℔ ℔ 6 ¢
Enterprise "Potts" ..... dis 40 %

Sandpaper.—Baeder & Adamson ..... dis 20 %

Sash Weights.—Patent Eye ..... ℔ ℔ 1¼¢

Saws.—Hand Saws, Disston's ..... dis 20 %
Cross-Cut Saws.
Disston's, Common Tooth ..... ℔ foot 68¢, dis 45 %
Disston's Great American Tooth ..... ℔ foot 68¢, dis 45 %
M. B. & D., Hand Saws ..... dis 33⅓ %
Richardson Bros ..... dis 25 %

Saw Blades.—Disston ..... dis 20 %
Welch & Griffith's, Extra ..... ℔ doz $7.20
Welch & Griffith, No. 2 ..... ℔ doz 6.00

Scales.—Fairbanks ..... dis 20 %

Screen Window and Door Frames.
Hart's Screen Frames, No. 1 ..... ℔ doz $1.75
Hart's Screen Frames, No. 2 ..... ℔ doz 2.25
Hart's Screen Doors, No. 10 ..... ℔ doz 7.50

Screws.
Wood Screws—List February 15, 1886.
Flat-Head Iron ..... dis 75&10 %
Round-Head Iron ..... dis 70&10 %
Flat-Head Brass ..... dis 75 %
Round-Head Brass ..... dis 70 %
Flat-Head Bronze ..... dis 75 %
Round-Head Bronze ..... dis 70 %
Machine—
Flat-Head, Iron ..... dis 60 %
Round-Head Iron ..... dis 55 %

Scythes.
Blood's Clipper Scythes ..... ℔ doz $6.50
Nolin's Clipper Scythes ..... ℔ doz 7.00
Nolin's Solid Steel Scythes ..... ℔ doz 9.00
Emerson Clipper Scythes 7.00
Emerson Solid Steel Scythes 9.00

Shears.—American Shear Co., new list ..... dis 70 %

Shot.—Le Roy ..... ℔ ℔ 6¢

Shovels.—O. Ames, new list ..... dis 20 %
O. Ames, other brands, new list ..... dis 20 %

Sinks.—Magee Patent ..... dis 30 %

Snow Shovels $3.75

Skates.—Eastern Acme.
No. 5, Steel Runners ..... ℔ pair $1.00
No. 7, Steel Runners, hardened ..... ℔ pair 1.50
No. 10, Steel Runners, hardened, Nickel Plated ..... ℔ pair 2.00

Stocks and Dies.—King's ..... dis 10&5 %

Tacks.—Eastern Mfg. Co.
American Iron Carpet Tacks, all kinds ..... dis 65&10 %
Steel Carpet Tacks, all kinds
Swedes Iron Carpet Tacks, all kinds
Swedes Iron Tacks
Swedes Iron Upholsterers' Tacks } dis 60&10 %
Tinned Swedes Iron Tacks
Tinned Swedes Iron Upholsterers' Tacks
American Iron Cut Tacks ..... dis 55&10 %
Copper Tacks
Copper Finishing and Trunk Nails
Cigar Box Nails
Finishing Nails
Hungarian Nails and Miners' Tacks
Gimp and Lace Tacks } dis 50&10 %
Tinned Gimp and Lace Tacks
Trunk and Clout Nails
Tinned Trunk and Clout Nails
Basket Nails
Chair Nails
Common and Patent Brads ..... dis 45&10 %

Transom Lifters.
Wollensak's Patent Iron Bronzed ..... dis 50 %

Traps.—Game.
Newhouse ..... dis 35 %
Oneida Pattern ..... dis 60&10&10@70 %
Game, Blake's Patent ..... dis 40&10&5 %

Vises.—Simpson's Adjustable ..... dis 33⅓ %
Howard Vise Co ..... dis 33⅓ %
I. C. T. Co.'s Blacksmiths' ..... dis 50&10 %

Weather Strips.
Richmond Bottom Strip, Walnut ..... ℔ doz $5.00
Richmond Bottom Strip, Imit. Walnut ..... ℔ doz
Richmond Bottom for Double Doors ..... ℔ doz 15.00
Packer's ..... ℔ doz 4.50
Underwood's ..... ℔ pair, plain $3.75, rubber 4.00

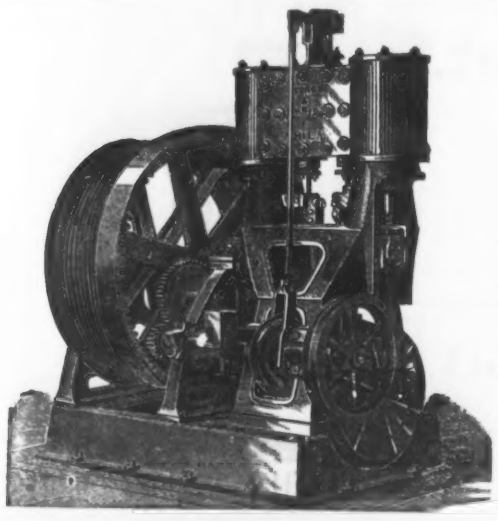
Wire Cloth.—"Clinton" ..... ℔ sq. ft. 2 ¢

Wire Fence.
Buffalo Painted Barbed ..... ℔ ℔ 4 ¢
Buffalo Galvanized Barbed ..... ℔ ℔ 4½¢

Wrenches.—A. G. Coe's ..... dis 60 %
Girard Mfg. Co ..... dis 60&10 %
Girard Adj ..... dis 70&10 %
"Always Ready" ..... dis 25 %

Wringers.
Novelty for Common Tubs No. 2—10-in ..... ℔ doz $27.00
No. 3—11-in ..... ℔ doz 31.50
Excelsior for Stationary Tubs No. E—10-inch ..... ℔ doz 39.00
Excelsior for Stationary Tubs No. F—11-inch ..... ℔ doz 43.50
Excelsior with Folding Bench No. A—10-inch ..... ℔ doz 45.00
Excelsior with Folding Bench No. B—11-inch ..... ℔ doz 52.50
Novelty Set Tub, E ..... ℔ doz .....
Universal ..... ℔ doz 27.00
Eureka ..... ℔ doz 20.00

Zinc ..... ℔ ℔ 5½¢



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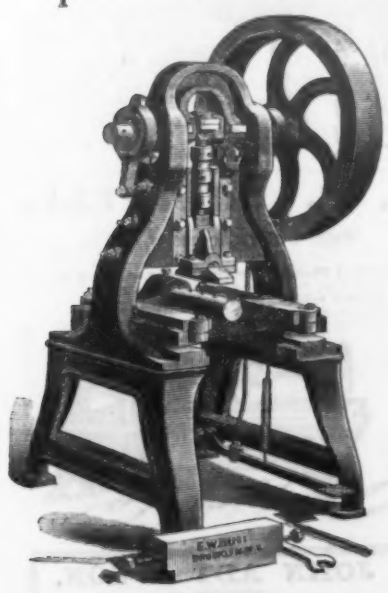

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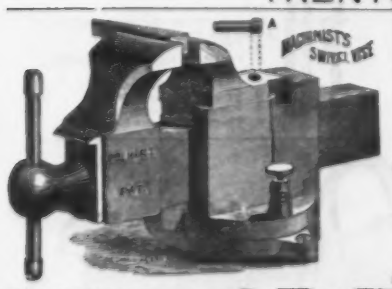

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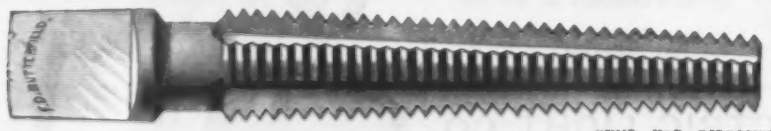

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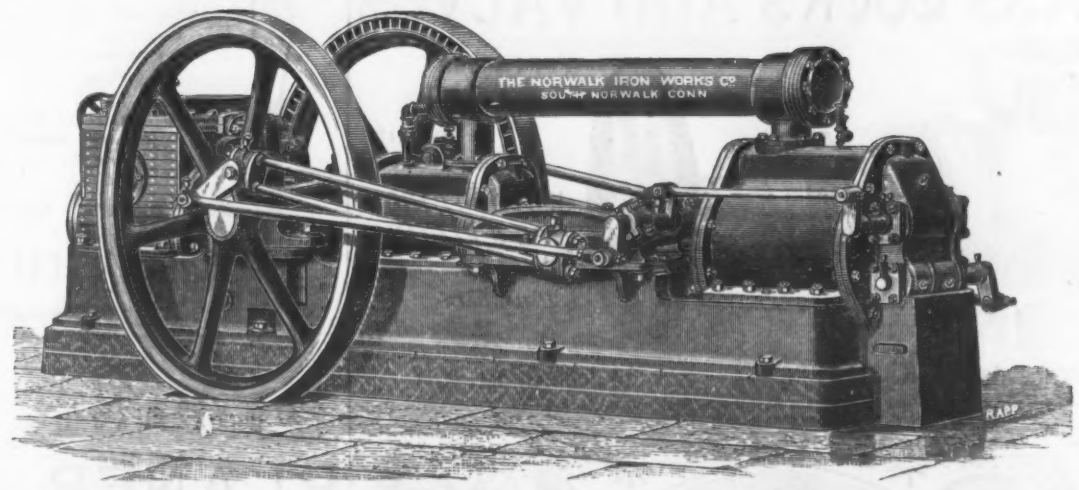

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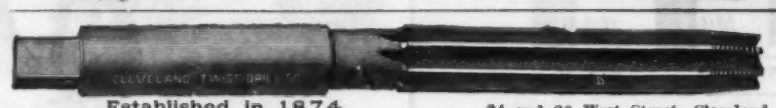

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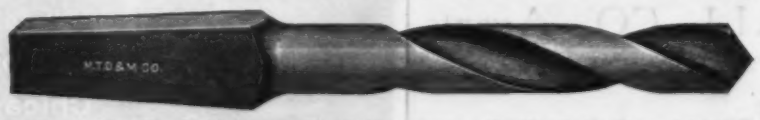

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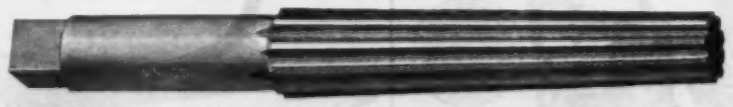

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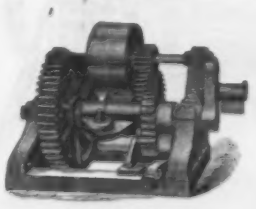

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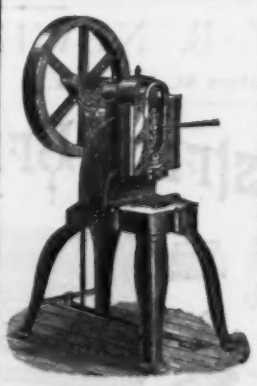

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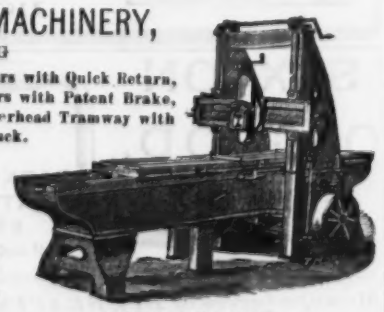

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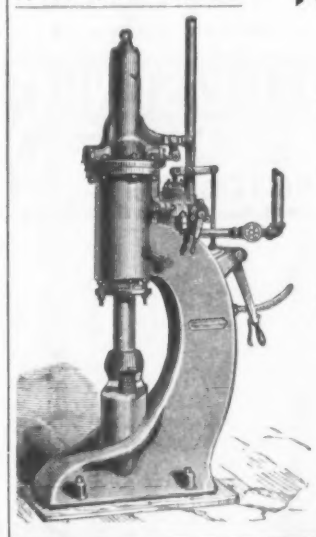

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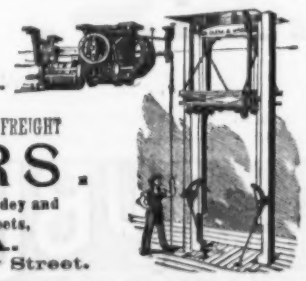

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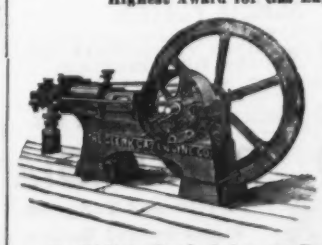

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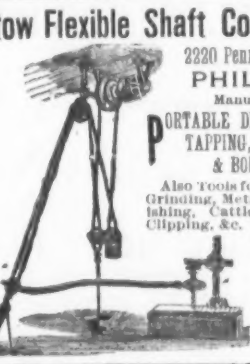

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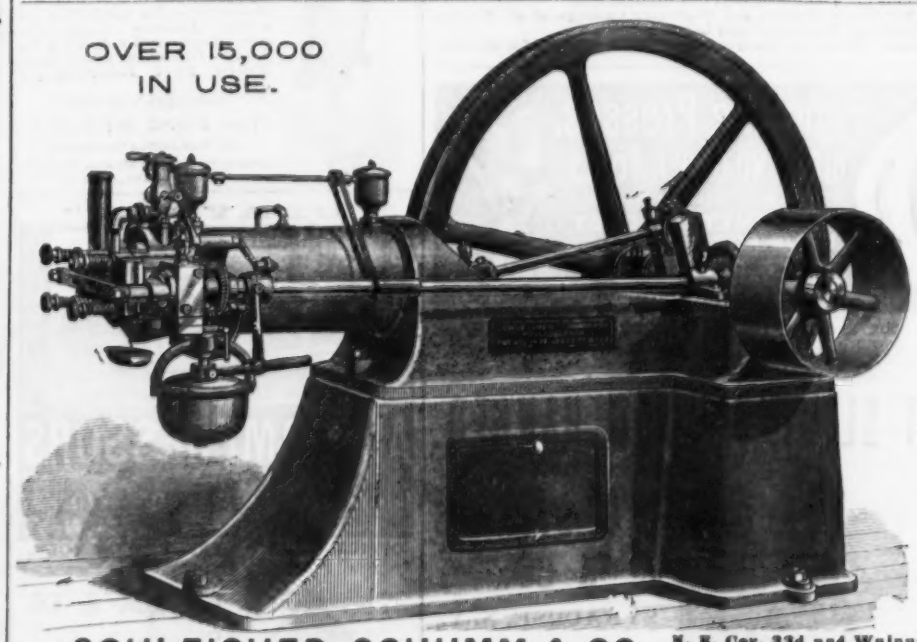

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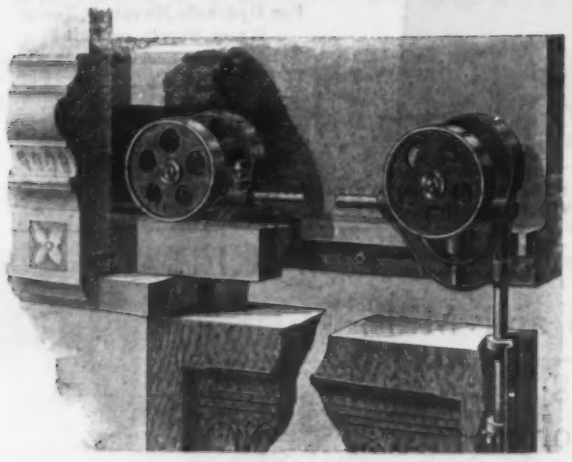

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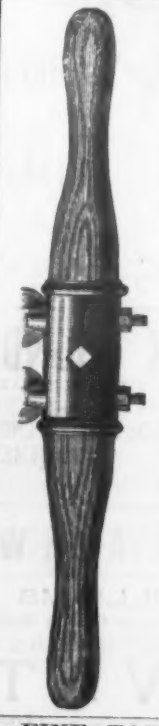

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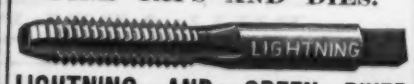

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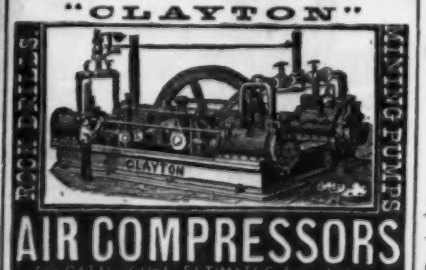

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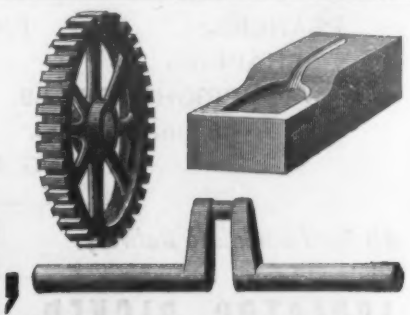

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